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Editorial.

A NATION'S SORROW.

SINCE our last number appeared a great sorrow has fallen upon the nation. Our Sovereign Lady QUEEN VICTORIA has gone from the midst of us, and we mourn the loss of one who was not only the most brilliant occupant of the British throne, but a wise and gentle counsellor, a pattern of every queenly and every womanly virtue, a true mother of her people. Perhaps no body of men are more indebted to Her late Majesty than veterinary surgeons. The Victorian era saw the rise of our profession,—we might say its very birth, for before the Queen's reign we were regarded as mere farriers, as little better than blacksmiths, perhaps lower and worse, because we were looked upon as knaves and charlatans who pretended to cure diseases, of whose nature we knew nothing, with drugs with whose operations we were quite unacquainted. Under the beneficent sway of Queen Victoria the suspicion and contempt which were formerly our portion gave way to more enlightened treatment; we obtained due recognition of our merits; a place of honour was assigned to us in the national hierarchy; we rose to the dignity of a profession. Charters subscribed by her own royal hand were granted to us, under which we were enabled as a Corporation to regulate the action of our members, maintain our dignity and independence, approach the Government in defence of our rights, when necessary, with the force that comes from cohesion and unity of purpose, and that therefore inspires respect and commands attention; we were able under the Royal ægis to organise the teaching of our branch of medicine, and confer diplomas on successful students—diplomas which have a world-wide reputation, and are everywhere regarded as the hall-mark of character and skill.

Her late Majesty was intensely interested in everything that related to agriculture and cattle-breeding, and thus indirectly as well as directly benefited our profession by creating a demand for the services of skilled veterinarians. We lament the loss of our gracious Queen, but we look with hope and thankfulness to her successor, King Edward, and trust that under his enlightened rule we shall still further prosper.

A PLEA FOR ADDITIONAL EXAMINERS.

I AM sorry that the Council of the Royal College did not see its way to accept the proposal to appoint additional examiners. Perhaps the matter was not laid before the Council in the right way or not so fully as it might have been, and as I was one of the prime movers in the scheme I may be permitted, though somewhat late in the day, to justify my conduct and explain my intentions.

It is well known in veterinary circles that much inconvenience is caused, and much loss of time, by the unexpected absence of an examiner on one or other of the days set aside for the examination of our candidates. The examiner need not be himself to blame—as a matter of fact, or of history, he seldom is—but the accidents of life, and especially of veterinary life, are so many that it is next to impossible for one of our body to say where he will be at a given hour or on a given day. And it has to be kept in mind that for examiners we want neither the very young men of the profession nor the very old. Young men are apt to be faddists and crotcheteers—sometimes, we are sorry to whisper confidentially, a trifle vain and conceited—and they are disposed to be too severe; they know their subject thoroughly well, but they think there is nothing else worth knowing, and they are apt to be unsympathetic and perhaps intolerant of apparent weakness in candidates from mere narrowness of view. They forget that, whilst truth is everlastingly the same, it presents itself to different men under different aspects, and claims homage in various tongues, each of which is harmonious, though they may be mutually difficult of interpretation. On the other hand, it is seldom desirable to appoint old and retired men to examinerships. They may have abundant leisure, but they may have lost all capacity for enjoying it or utilising it; they may have lost all the freshness of mind and all the elasticity which characterise youth, and which not many men—a chosen few only, we fear—retain to the end of life. "Those whom the gods love die young," said the ancient Greeks, and this beautiful phrase means, not that all amiable persons die in boyhood or girlhood, as some stupid people imagine, but that youthful freshness and joyfulness remains for ever as a precious gift to those who lead pure and noble lives. Still the fact remains that old men mostly become rigid, unaccommodating, impenetrable; they do not understand that change must go on if the body social, political, scientific, is to be kept healthy, or if they do recognise this truth they can make no practical use of it; nature may forbid, ossification may have begun.

We are therefore compelled to choose our examiners from men who have got over the vanities and frivolities of youth, and who are not yet victims to the slothfulness and callous indifference of age. Now such men, being the very cream of the profession, are always busy men; do what they like, they find it difficult to make

definite promises; clients insist on seeing them at all hours of the day and night, and clients cannot be neglected. Man shall not live by bread alone, but unfortunately man cannot live without it. We cannot therefore blame our examiners if they fail to keep an engagement, however much we may deplore their absence, however great may be the embarrassment which that absence may entail on teacher and candidate. There are, of course, other possible causes of failure to keep engagements, such as disease, sudden and unexpected bereavements, which stupify for the moment, and the minor accidents of life, which affect us all, old and young, but these each reader can fill in for himself.

Now my proposal was to eliminate accident as far as possible and yet not increase expense. Where there are two examiners at present I would have three, and I would have for the third no mere emergency man, still less a merely ornamental man, but a full-fledged colleague of the other two. And I would distribute the work and the fees equally. For example, I would instruct A. and B. to examine in May, B. and C. in July, and C. and A. in December. Thus each examiner would have two turns, and would be paid accordingly. Further, I would warn each of the three that he might be called upon suddenly to do his colleague's work; thus I would instruct A. to hold himself in readiness to examine in May if required, and so with the others. All examiners would stand on an equal footing, and there would therefore be no question of first class and second class, or principal and subordinate. No retaining fee would be required, as each examiner would be assured of his share of the emoluments, and would have a chance of more if a colleague broke down. Further, there would be a continuity of policy if even one examiner on each subject were retained for the new Board when a change took place. As things at present stand it must be very difficult for the President to find an examiner for an emergency: he may have his eye on a rising man eager for a chance of distinguishing himself, or he may know of nobody. Even if he knows of a good examiner ready to take a vacant post, he can hardly ask him to prepare for it; on the one hand he might be accused of favouritism or nepotism, or that partiality which is so unseemly in a judge, and on the other hand he might be accused of a desire to hasten that resignation of a reigning examiner, burying him, so to speak, before he was dead. If, desirous to escape reproach, he refused to keep a list of likely men, he might find himself at any moment in a dreadful dilemma. He might find himself forced to a hasty decision, appointing the first man he can think of, and the consequences of such haste might be disastrous to the Royal College, the schools, and the students. A man may know his subject thoroughly, and yet, through lack of the analytic turn of mind, be utterly unable to examine in it. Teachers and examiners, like poets, are born, not made, and a man ought to furnish some proof of his fitness for the examiner's post

before he receives the appointment, and this appointment ought to be made after careful judicial deliberation, and in such a way and so openly that an opportunity may be given for the hearing of all reasonable objections. If it be answered that instructions will be given to all emergency examiners to be extremely lenient to candidates, I say that is no solution of the difficulty: there are some candidates who do not deserve to pass, but ought to be sent back to their classes: if you pass these men you fill them with vanity and foolish pride, and you do injustice by implication to other men—perhaps better men—who have been set back a term or two by a severer examiner; you may even let loose on the public an immature practitioner who will merely bring discredit on the profession. I trust the Royal College will reconsider this question in the light of my proposals.

A DWINDLING INSTITUTION.

On another page we print a very painful statement taken from the *American Veterinary Review*. According to what is there stated we may in a short time see the complete failure of the efforts of a generous and high-minded corporation to maintain a veterinary school. We feel quite sure that everything has been done at Harvard to give veterinary teaching a fair chance, but of course we cannot expect that University to go on losing money for ever. All the same, it is very pitiable and very disheartening to see the gradual decline and the approaching extinction of our branch of medical science there. It will be noticed that the Dean hopes for a public endowment, which will save the department before it reaches its last gasp, but that is problematical. What a chance for a millionaire, what an opportunity of achieving immortality and the grateful applause of his fellows whilst on earth! But it is more; it is an appeal to the American Government to show itself worthy of its great traditions. We trust some wise man will take up the cause of veterinary medicine, and pass a measure which will secure the future of an excellent institution. With its enormous extent of territory, its vast breadth of corn-land, requiring the help of horses for its cultivation, its huge cities, and its immense net-work of railways, America ought to make the care of its domestic animals and the study of their health conditions one of its most important public departments. No excuse ought to be necessary on the part of American statesmen for introducing a Bill to this effect.

Let our own Government take warning. It has callously left veterinary schools in this country to sink or swim as they chose, and now, with a great war on its hands not yet completed, and a dreary prospect of a difficult settlement in South Africa, it finds itself relying on the help of private individuals, whom it has

studiously ignored. We will do our duty to our King and country whilst strength remains, but that strength is not inexhaustible, it may give way at any moment. Veterinary studies are fairly well organised in this country, but there is an economic weakness which may develop into a calamity. Never was there such an opportunity for a comprehensive measure by a strong Government. No enormous sum is required to put veterinary teaching in England and Scotland on a sound and enduring basis, and so to remove a grievance and deal out equal justice to the three kingdoms. But once let existing institutions and their organisations disappear, and it will be very difficult to reconstruct them. We say, Long live King Edward! and may he inaugurate a glorious reign by showing his appreciation of the labours of veterinary surgeons!

Royal College of Veterinary Surgeons.

On Friday, the 11th inst., a Quarterly Meeting of the Council of the Royal College of Veterinary Surgeons was held at the College, the President, Mr. A. C. Cope, occupying the Chair.

The following members signed the attendance book:—Colonel Buck, Colonel Lambert, Messrs. Abson, Barrett, Byrne, Carter, Dollar, Edgar, Fraser, Lawson, Locke, M'Call, M'Fadyean, Mason, Mulvey, Penberthy, Simpson, Trigger, Villar, Wartnaby, Winter, and Wragg. There were also present Mr. Thatcher, Solicitor, and Mr. Hill, Secretary.

The Secretary announced that letters regretting inability to attend had been received from Messrs. Bower, Hartley, Allen, and Professors Dewar and W. O. Williams.

The minutes of the previous meetings were taken as read and agreed to.

Letters were received from Professor Dewar and Professor Mettam regretting their inability to be present to personally receive the honour of the Steel Memorial Medals, and it was therefore decided that the Medals should be forwarded to them.

A letter was read from Mr. Goodall, notifying the Council that, owing to the interference of his practice by the frequent absence from home, which the requirements of the position entailed, he was reluctantly compelled not to seek re-election as Examiner. A letter was also read from Mr. Frank Pogson, of Trinidad, complaining that in that island a veterinary surgeon was not considered a professional man. Mr. Pogson requested the Council to approach Mr. Chamberlain, and, if possible, to remove the slight that was cast upon the profession.

On the motion of Mr. Simpson, seconded by Mr. Mulvey, it was resolved to draw Mr. Pogson's attention to the paragraph of the Charter declaring that the veterinary art should be deemed and recognised as a profession.

Obituary List.

The Secretary read the obituary list, which contained the names of a very large number of deceased members, amongst which was that of the late Professor Williams.

Mr. WRAGG.—Mr. President, We all very much regret the death of our old friend Professor Williams, a gentleman so well known to the whole profession, if not personally, at least by his writings. I beg to move that a letter of condolence be sent by this Council to the family of the late Professor Williams.

Mr. MULWEY.—I beg to second that.

Mr. TRIGGER.—I should like to say a word in support. I am sure we shall all agree in the vote of condolence, and I think we shall be all glad to know that steps have been taken to perpetuate the memory of Professor Williams.

The motion was carried unanimously.

PRESENTATIONS TO LIBRARY.

Donations are announced as having been received since the last Meeting of the following works:—"Calendar of the Royal College of Surgeons of England;" "Journal of Comparative Pathology and Therapeutics," by the Editor; "Veterinary Journal," and the "Veterinarian," by the Editors; "Annual Report of the Bengal Veterinary College; and the Annual Report of the Imperial Bacteriologist for the year 1899-1900.

The thanks of the Council were accorded to the donors.

FINANCE COMMITTEE.

Mr. TRIGGER, as Chairman, read the Report of the Finance Committee, and of the Special Finance Committee appointed to consider the financial condition of the College. The Special Committee, after further investigation of the items of income and expenditure, reported that the Reporter's fees for the last year amounted to £58 : 11 : 11, as against £14 ten years ago. The Committee recommended that in future the verbatim reports taken should not be transcribed. The Committee also stated that whilst recognising that the individual law charges were not excessive, recommended that every endeavour should be made by the Registration Committee to curtail them as far as possible. The loss on the sale of the Register was £30 per annum, but, having regard to the Charter, that was unavoidable. With regard to the examinations, the Committee reported that although it might be possible to cut down the expenses to a slight extent, yet a considerable loss was being sustained annually, and unless the examination expenses were very much reduced, the financial condition of the College would be considerably embarrassed.

The Report of the Special Committee was received by the Finance Committee at a meeting earlier in the day.

On the motion of Mr. TRIGGER, seconded by Mr. VILLAR, the Report was adopted.

REGISTRATION COMMITTEE.

The CHAIRMAN of the Registration Committee, Mr. SIMPSON, read the Report, which detailed the work which the Committee had done. The Report stated that the Committee had considered the application of Mr. Chiswell for the restoration of his name to the Register, it having been removed by virtue of sub-section 4 of section 5, and recommended the name to be restored on the usual terms. Another application for restoration had been referred back for evidence of good behaviour in the mean-

time. The Committee recommended prosecutions in certain cases. They had considered several cases of advertising, and in some undertakings had been given, and in others the explanations were satisfactory.

On the motion of Mr. SIMPSON, seconded by Mr. MULVEY, the Report was adopted, and the seal of the College ordered to be attached to authorities for the prosecution of certain cases.

EXAMINATION COMMITTEE.

Mr. MULVEY read the Report of the Examination Committee, which recommended that a reserve examiner should be appointed in each section of the Board of Examiners. Mr. Mulvey moved that the Report be adopted.

Mr. WARTNABY seconded.

Professor EDGAR said he presumed it would mean a retaining fee being paid to the reserve examiner, which would add very considerably to the already overburdened finances of the College. It could hardly be expected that any gentleman of position would lay himself open to be called upon at any specific time to act as examiner without having some retaining fee for his services. If it was to be made a practical suggestion the appointment would have to be an honorary one.

Mr. MULVEY said it was never intended that any fee should be paid. The appointment would be purely honorary, and in the event of any examiner being required in any subject that gentleman would be called upon to act.

Professor M'FADYEAN thought it was the intention to appoint reserve examiners from those who were unsuccessful in obtaining an appointment as examiners. He agreed with Professor Edgar that no applicant of any respectability or standing would accept the position of reserve examiner when the Council had refused to put him in the position of examiner. The appointment of a reserve examiner with a retaining fee was not a judicious course in view of the present state of the finances of the College. He moved that the Report be received and adopted without that particular recommendation.

Mr. TRIGGER seconded the amendment. He said it was in the hands of the President to appoint a substitute when necessary, and in his year of presidency it happened that he was more than once called upon to do so.

On the amendment being put it was carried, eleven voting for and ten against.

The Report of the Library and Museum Committee, which contained nothing of public importance, was read and adopted.

The Reports of the Courts of Examiners for the Fellowship and Membership examination and the Walley Memorial Prize were also read, and, on the motion of Mr. Mulvey, seconded by Mr. Mason, referred to the Examination Committee with instructions to settle the form of the prize to be awarded to the successful candidate in the Walley Memorial Examination. This gentleman was Mr. William Harris, of the Dick College, the only candidate who entered.

SPECIAL MEETING.

The Council resolved itself into a Special Meeting to consider two motions on the agenda, one in the name of Professor Dewar and the other in the name of Professor M'Call.

Professor DEWAR's motion was as follows:—

"To amend bye-law 52 by the deletion of the words 'on June 30th 1896.' This bye-law to come into force on the 1st October 1901."

The SECRETARY read a letter from Professor Dewar in which he apologised for being unable to attend the meeting, and gave notice of a similar motion for the April meeting.

Mr. SIMPSON thought that by the expression of Professor Dewar's wishes contained in the letter he desired to withdraw the notice of motion on the agenda, which, the solicitor said, was irregular, and to substitute the one in his letter for it.

Professor M'FADYEAN considered that Professor Dewar was in the hands of the Council, and submitted that the notice of motion was perfectly regular. He should be very sorry to do anything discourteous to Professor Dewar, especially as he understood that he was unable to be present that day through indisposition, but, on the other hand, there were the interests of the corporate body and of the schools and students to consider, and he thought it was inadvisable that the matter should be hung up for another three months. If, therefore, there was nothing forbidding the course in the bye-laws, he proposed in the Professor's absence to move the resolution. That was not due to any conversion on his part to Professor Dewar's views on the subject, but because he thought it was a most mischievous proposal. It was, he believed, the third occasion almost in immediate succession on which Professor Dewar had moved the alteration of the bye-laws in that direction. The effect of it would be that the students who entered College last October on certificates acceptable in the existing regulations would not be allowed to go up for examination. Not only that, but should the motion be put off until April and come up then, in the event of it being passed it was a ridiculously inadequate intimation to give to those who were now preparing for the examination according to the regulations printed in the Register. He therefore moved that bye-law 52 be amended by the deletion of the words "on June 30th, 1896."

Mr. SIMPSON asked the ruling of the President as to whether the notice of motion was in order or not.

The SOLICITOR (Mr. Thatcher) explained that at the last meeting Professor Dewar moved a similar motion, which was defeated, and at the end of the meeting he said he would give notice for the next meeting of the same motion, which was simply that the bye-law should be amended by the deletion of the words "on June 30th, 1896." Afterwards Professor Dewar re-considered the matter, and thought there should be a time limit, and when he suspended the notice on the board he put the time limit on also.

Professor M'FADYEAN entirely agreed with the Solicitor, and said he had failed to observe that a date was inserted at which the motion, if carried, would come into effect.

Professor DEWAR'S motion then dropped, and the notice of motion enclosed in his letter was suspended as requested by him.

The other notice of motion on the paper was that by Professor M'Call:—

"That bye-law 52 be altered by the addition of the following words, 'Excepting only that any student who shall present a certificate granted by the Educational Institute of Scotland, showing that he has passed an examination equivalent in all respects to their examination prevailing on the 30th June 1896, and then known as

the Preliminary Medical Examination, shall be entitled to registration as a veterinary student.'"

Mr. SIMPSON asked whether the notice of motion was in order.

The SOLICITOR was afraid it was not. If the members would look at the minutes of the last meeting of the Council he did not think they would find the motion appeared there.

Mr. MULVEY agreed, but at the same time thought the notice as suspended was not in order, because there was a date which would not allow for it to mature.

Mr. VILLAR suggested that the original minutes of the last meeting should be looked at to see what really did happen. In the minutes which had been taken as read, it was stated, "Professor M'Call gave notice that he would bring forward a similar resolution to the one he had moved on the present occasion at the next meeting."

The SOLICITOR said the motion by Professor M'Call at the last meeting was—"That the Council of the Royal College of Veterinary Surgeons make arrangements to conduct a Special Preliminary Examination for Veterinary Students." That was lost, and Professor M'Call then gave notice that he would bring forward a similar resolution at the next meeting. The motion now brought forward was obviously not the same motion that was brought forward at the last meeting.

Professor M'CALL said it was a similar one.

The SOLICITOR said he did not think it covered it.

The PRESIDENT stopped all further discussion by ruling it out of order.

Professor M'CALL then gave notice that at the next meeting he would bring forward the motion identically word for word as it was at present on the agenda.

NOTICES OF MOTION.

Professor EDGAR gave notice of his intention to move at the next meeting "to amend bye-law 52 by the deletion of the words '1st January 1896.' This bye-law to come into force on the 1st October 1902."

Mr. TRIGGER said he believed there was a general feeling throughout the Council that the question of stable management and veterinary hygiene in the examinations were over-lapping, and accordingly he gave notice to move at the next meeting the following resolution:—"To alter bye-law 72 by transferring paragraph 3 of Class B examination to paragraph 3 of Class C examination; to extend the time 'oral,' paragraph 3 class C."

A hearty vote of thanks having been accorded to the President for the manner in which he had carried through the business of the meeting, the proceedings terminated.

EXAMINATION FOR FELLOWSHIP DEGREE.

A MEETING of the Court of Examiners for this degree was held on the 15th December last.

Five candidates entered for this Examination, and the following is a list of those who passed and duly received the diploma:—Messrs J. H. Taylor, Darlington; J. H. Wynne, Denbigh; Charles Peirce, Paddington; T. K. Ramsey, Market Drayton.

The Examiners were Dr. G. Fleming, C.B., Professor J. Macqueen, and Mr. J. Malcolm.

ARTHUR WM. HILL,
Secretary.

DECEMBER EXAMINATIONS IN EDINBURGH AND GLASGOW.

AT Meetings of the Board of Examiners held in Edinburgh and in Glasgow on December 14th for the Written Examination, and December 19th, 20th, and 21st for the Oral and Practical Examinations, the following gentlemen passed their Final Examination, and were admitted Members of the Royal College of Veterinary Surgeons :—

Dick College.—Messrs. F. H. W. Cundell,* P. Donovan, J. Forrest, W. Ludgate, J. O'Brien, W. J. Coffey.

New College.—J. Stafford.*

Glasgow College.—Messrs. D. M'Hattie, J. Montgomerie, D. P. Harvey, E. Souter.

The following gentlemen passed their Third Examination :—*Dick College.*—Messrs. K. Barker and M. Purcell.

New College.—Messrs. R. Finch, A. B. Mattinson, F. Moon, Z. B. Rutherford, H. Sanderson.

Glasgow College.—C. Bell.

The following gentlemen passed their Second Examination :—*Dick College.*—Messrs. R. P. Johns, R. N. Lewis, H. Mackay, R. Murray.

New College.—Messrs. R. Mairs, J. A. Shaw, J. C. Smith, A. Walker,* G. H. Nicolson.*

Glasgow College.—Messrs. W. Gardner, J. S. Woodrow,* J. Crooks.

The following gentlemen passed their First Examination :—*Dick College.*—Messrs. F. Drinkwater and A. J. Horner.

New College.—Messrs. A. Barr, J. A. Fearnside, E. A. Nickson, R. P. Ranken, A. Whitehead, J. O'Leary.

Glasgow College.—T. L. Craig,* J. Spreul, K. M. M'Kenzie.

R. RUTHERFORD,
Secretary Board of Examiners.

* Marked thus * passed with Second Class Honours.

Victoria Veterinary Benevolent Fund.

A MEETING of the Council was held at 10 Red Lion Square on Friday, the 11th inst. Present—Professor Penberthy (President), Professor M'Fadyean, Messrs. Burrell, Sheather, Simpson, Dollar, Villar, Wragg, and W. T. Barrett, Hon. Secretary.

Professor Pritchard was also present on the invitation of the Secretary.

The SECRETARY reported that monthly payments up to £96 yearly were being made to recipients of the Fund. He also expressed his regret that many promised subscriptions were in arrear, and hoped that an effort would be made to materially increase the annual income, existent calls on which severely taxed the resources of the Fund, and limited its power for good. The Council then proceeded to consider the several cases in which assistance was requested, and £1 a month for specified periods was voted.

1. Mrs. A, widow, aged fifty, six children, one of whom only is able to to work, whose earnings are the only visible means of subsistence. Mrs. A writes to say the £1 a month received from the Fund during the past year has saved her from utter ruin.

2. Mrs. B, widow; husband young man just becoming established in practice, died of pneumonia eighteen months since, leaving her with six children, practically penniless. Mrs. B writes entreating a continuation of the grant which she has received since her husband's death.
3. Mrs. C, widow, ten children, no means, children not old enough to earn anything considerable. Mrs. C does any kind of work procurable, but without the aid of the Fund could not exist out of the workhouse.
4. Mrs. D, widow, three children, no means, except small help from poor family, states that through assistance of the Fund she has managed to become trained as a nurse, and hopes to be able, with a temporary continuance of the grant, to earn a livelihood for herself and children.
5. Mrs. E, deserted by husband, five children, appealed to the Council in deep distress, was relieved, and implores further assistance.
6. Mr. F, aged forty-two, hopelessly afflicted with nervous disease, helpless, being unable to feed himself, no means of support, being absolutely dependent on poor friends and the aid afforded by this Fund.
7. Mr. G, aged forty-one, thrown from horse, progressive paralysis consequent on injury to spine, absolutely helpless and hopeless, having been discharged from hospital incurable, physical suffering intense.
8. Mr. H, an old member, many years afflicted with rheumatism, unable to leave his bed, practice lost, and but for the help of the Fund his home must have been broken up.

A fresh case, the correctness of whose details was vouched for by well-known members of the profession, was that of the widow of a young member who recently died, as a result of injury to the spine from a fall from his horse. This lady was left practically penniless, and appealed to the Fund to make a start in life. After being assured that any sum voted for this purpose would be applied with fair prospect of success, a sum of £10 was voted.

Other cases were brought to the notice of the meeting, but it was felt with great regret that the means at the disposal of the Council would not permit of further disbursements at present. In view of the acute distress which evidently existed, and of the Council's inability to grant adequate relief, it was resolved to make an urgent appeal to the profession for annual subscriptions.

The President then called upon Professor Pritchard, who, he said, would make an announcement agreeable to every one present.

Professor PRITCHARD expressed his pleasure at being present. He had been much affected by the sad stories of pain, distress, and want to which he had listened during the deliberations of the Council. He was there to make an offer which he hoped would be agreeable to all. Many, if not all, of the members of that Council would remember the old Veterinary Medical Association which so long held its meetings at the Royal Veterinary College, Camden Town. For some reason this Society had ceased to exist as an association holding meetings, but it was possessed of certain funds originally invested in the names of three trustees, of whom he was

the sole survivor. These funds amounted to £200 : 1 : 2. He thought it right that such money should be applied in some way to the benefit of the profession, and had decided, after consultation with his friends, to offer, after certain legal formalities had been complied with, to hand the amount over to the Victoria Veterinary Benevolent Fund. What he had heard that evening of the painful cases considered by the Council, and the good work this Fund was doing, had confirmed and strengthened his intention, and he deemed it a privilege to be able in some way to assist in the work, and asked the Council's acceptance of the amount, which he would hand over to the Treasurer of the Fund after obtaining the certificates of death of his late co-trustees.

The PRESIDENT (Professor Penberthy) in appropriate language referred to the generous kindness of Professor Pritchard, which would materially further the objects of the Fund, and, he ventured to hope, reflect much gratification on the donor. Inasmuch as the late Professor Spooner was so closely identified with the initiation and development of the old Veterinary Medical Society, he (Professor Penberthy) thought the name of Professor Spooner should be in some way associated with this substantial amount now offered. He should throw out the suggestion that the sum be invested, and the annual proceeds, supplemented by the moneys of the Fund, given as the Spooner Annuity.

Professor PRITCHARD being consulted, assented to this course, saying he too would be pleased if Professor Spooner's name could be perpetuated in this way.

Professor M'FADYEAN expressed his very cordial appreciation of Professor Pritchard's kind offer, and formally proposed that it be gratefully accepted. This proposition was carried unanimously and with acclamation.

Professor Pritchard was elected a life member of the Fund, and in his speech expressing his appreciation of the honour done him said he hoped in future to take an active part in the affairs of the Society, as until then he had no idea such an amount of distress existed. The Secretary expressed the hope that Members of the Council would make an effort to enlist subscribers to the Fund, as, unless an increased income were forthcoming, the good work of the Society would be curtailed. He believed the entire profession would appreciate Professor Pritchard's action, as undoubtedly this large sum of money could not be better applied.

W. F. BARRETT,
Hon. Sec. & Treasurer.

46 LEWISHAM HIGH ROAD,
LONDON, S.E.

British Congress on Tuberculosis.

President.

H.R.H. THE PRINCE OF WALES, K.G.

Vice-Presidents.

His Grace the Duke of Fife, K.T. ; His Grace the Duke of Northumberland, K.G. ; His Grace the Duke of Portland, K.G. ; His Grace the Duke of Bedford ; His Grace the Duke of Sutherland ; The Most Hon. the Marquess of Bath ; The Most Hon. the Marquess of Dufferin and Ava, K.P., P.C. ; The Right Hon. Earl Spencer, K.G., P.C. ; The Right Hon. the Earl of Harwicke ; The Right Hon.

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20 Hanover Square, London, W.

Objects of Congress.

His Royal Highness the Prince of Wales has graciously consented to open in person a British Congress on Tuberculosis in the Queen's Hall, London, at 3 o'clock in the afternoon of Monday, the 22d July 1901 ; and it has been decided that the Congress shall be held from Monday, 22d July, to Friday, 26th July.

Every British Colony and Dependency is invited to participate by sending delegates ; while the Governments of countries in Europe, Asia, and America are invited to send representative men of science and others, who will be the distinguished guests of the Congress.

The information already gained, both at home and abroad, shows that consumption and other forms of tuberculosis, although preventible and controllable by intelligent precautions, still remains the direct cause of a high rate of death and sickness. In the United Kingdom alone some 60,000 deaths are recorded annually from tuberculosis, and it is stated on good authority that at least thrice this number are constantly suffering from one form or another of the disease.

The knowledge of these facts, and the recognition that the disease is peculiarly amenable to open-air treatment, has aroused profound International interest in the question ; and in many countries public authorities have been led to put in force preventive measures directed against the propagation of consumption between human beings, between animals, and between human beings and animals.

The object of the forthcoming Congress is to exchange the information and experience gained throughout the world as to methods available for stamping out this disease. Papers will be read, and clinical and pathological demonstrations will be given; while the museum, which is to be a special feature of the Congress, will contain pathological and bacteriological collections, charts, models, and other exhibits.

Authorities in this and other countries will be invited to supply documents bearing upon the historical, geographical, and statistical aspects of the subject; while as a result of the papers and discussions, practical resolutions will be formulated which will serve to indicate the public and private measures best adapted for the suppression of tuberculosis.

The work will be divided into four Sections as follows:—

SECTION I.—STATE AND MUNICIPAL.

President.—Rt. Hon. Sir Herbert Maxwell, Bart., M.P., 49 Lennox Gardens, S.W.
Secretaries.—Dr. Bulstrode, L.G.B., Whitehall, S.W.
Dr. James Niven, Town Hall, Manchester.

SECTION II.—MEDICAL, INCLUDING CLIMATOLOGY AND SANATORIA.

President.—Sir R. Douglas Powell, Bart., M.D., 62 Wimpole Street, W.
Secretaries.—Sir Hugh Beevor, Bart., M.D., 17 Wimpole Street, W.
Dr. Hector Mackenzie, 59 Welbeck Street, W.
Dr. R. W. Philip, 45 Charlotte Street, Edinburgh.
Dr. William Caldwell, 1 College Square North, Belfast.

SECTION III.—PATHOLOGICAL INCLUDING BACTERIOLOGY.

President.—Prof. Sims Woodhead, M.D., 6 Scrope Terrace, Cambridge.
Secretaries.—Dr. Wethered, 83 Harley Street, W.
Prof. Robert Joyce, Liverpool (Univ. Coll.).
Dr. E. J. McWeeney, 84 St. Stephen's Green, Dublin.
Dr. Perkins, 41 Wimpole Street, London, W.

SECTION IV.—VETERINARY (TUBERCULOSIS IN ANIMALS).

President.—Sir George Brown, C.B., Bryn Hyfryd, Harrow.
Secretaries.—Prof. Hobday, F.R.C.V.S., 27 Lower Phillimore Place, Kensington, W.
Prof. Bradley, M.R.C.V.S., Royal (Dick's) Veterinary College, Edinburgh.
Prof. H. Woodruff, M.R.C.V.S., Royal Veterinary College, Camden Town, N.W.

EXHIBITION—THE MUSEUM OF PATHOLOGY, BACTERIOLOGY, AND PUBLIC HEALTH.

Chairman of Museum Committee.—Prof. Sims Woodhead, M.D., F.R.S.E. 6 Scrope Terrace, Cambridge.
Secretary.—W. Jobron Horne, M.B., M.R.C.P., 27 New Cavendish Street, Harley Street, W.

—to whom all correspondence relative to the Museum should be addressed.

RULES AND REGULATIONS.

1. The Congress shall consist of Honorary Members, Delegates, and Members.

Honorary Members shall be persons nominated by any foreign Government or University, or by the Executive Committee, and shall not pay any Subscription whatsoever.

Delegated and Ordinary Members shall be other persons—British, Colonial, or Foreign—who may wish to attend, including representatives from Governments or institutions within the British Empire.

2. Delegated and Ordinary Members will receive their cards on forwarding the sum of £1 to the Secretary-General of the Congress, 20 Hanover Square, W.

3. The holder of a ticket of membership is entitled to admission to all the meetings of the Congress, and to receive the "Transactions" and other publications.

Tickets to social gatherings and excursions will be allotted in order of application, or by ballot if necessary.

4. As the expenses of the Congress will be very considerable, donations to the Reception Fund are earnestly invited. Donations of more than one guinea will be considered as including Member's subscription, and will entitle the donor to all privileges of Membership. Donations from Corporate Bodies may include the subscriptions of representatives.

Original Papers.

MODERN SCIENTIFIC MEASUREMENTS.

BY JAMES HUNTER, F.R.A.S., F.R.C.P., F.R.S.E.

WHEN the Hebrew seer asked, "Who hath despised the day of small things?" he was no doubt fully aware of the error of judgment common to all primitive minds, whereby undue importance comes to be given to mere apparent magnitude. Indeed, concentrated attention to minute details, and to careful recording of the phenomena exhibited by matter and energy, in forms and quantities almost imperceptibly small, belongs but to the "Science" of yesterday and to-day. Accepting the terms "Science" and "Art" in their common significance, we cannot fail to notice a decided divergence of the paths along which, from their earliest inception, they seem to have progressed side by side in parallel if not identical tracks. In "Art," for the time being at least, *Impressionism* has willed that all care and precision formerly taken in its methods must be replaced by superlative fuzziness and limitless fog.

On the other hand "Science" has meanwhile been gradually passing into regions where rigid and almost infinitely precise sets of absolute measurements limit and define its every step. If still there linger among the ranks of the scientists of this age a few who on the elastic and comfortably adaptable lines of the "Philosophies" prefer to cultivate science untrammelled by weights and measures, their work counts for but little in the great store of human knowledge, although now and again the "notions" of such men (if really eminent) have their value in building up some provisional hypothesis.

In every branch of the science of to-day minute and accurate measurements of all kinds are the marked characteristic.

"The foot-rule rules the world," a remark recently made by an American celebrity in opening a new session of one of America's largest universities, applies, as he showed, to a very much wider sphere than that of the so-called mechanical world.

So much is this the case, that it must have struck every one, even cursorily observant of present-day scientific work, how in every field of investigation some carefully executed series of measurements or estimations is the prominent feature.

And not with the original investigator only, "the seeker after some new thing," but with the utilitarian practitioner or "business man" as well, there is an ever-increasing resort to "physical constants," the use of which he would fail to be capable of benefiting by but for some new tool of his trade, or some instrument of diagnosis (to use a medical term) which the modern expert in refined construction has placed in his hands. Need it be said that in the absence of equally refined methods of measurement such instruments could never have been made?

In a subject so highly specialised as is now the science and art of medicine, and in which every available assistance from modern Physics is at once taken advantage of, it necessarily follows that, to be at all useful in its application, every method common to these two great divisions of science—the two greatest in fact, from the human interest point of view—must he under equally precise conditions in both. Indeed, it would appear that one of the chief causes of the recent wonderful developments in many classes of instruments of precision has been the demand which practical medicine as well as medical research has continued to make for still greater delicacy in the construction of the many appliances now considered indispensable. Perhaps the best instance of this stimulus is the astonishing perfection of the modern microscopic lens; so much so, indeed, that one may safely assume that less than two per cent. of the finest specimens of it are to be found in use outside the medical prefession, or the professions more or less immediately connected with it.

In speaking of the above, it naturally follows that with users of the microscope as a "trade tool," the micrometer finds quite as useful an application as in the telescope of the astronomer; at least we shall suppose that its microscopic utility is fully taken advantage of: bacteriology alone would seem to indicate this. With so many important advances in the direction of absolute measurements in all departments of science, it can hardly be thought likely that "Medicine" can dodge along on the old lines with its *quantum suff.* in lieu of precise weights, its old rule of thumb estimations, and its ambiguous physical terms (often as it would appear purposely so).

Perhaps the idea that living nature refused to be tied down to precise measurements, and that the physics of a machine followed totally different laws from those regulating living beings, had much to do with delaying the introduction of precise measurements and refined physical methods into medical work. But what a difference within the last few years! And need we wonder, when it is remembered how profound a change takes place in the animal economy upon the alteration of the body temperature even a few degrees—how serious the consequences which follow pathological alterations in even the calibre alone of some of the more important tissue

elements, changes which only an expert with refined appliances may discover—how disastrous the results of the entrance into the organism of a few specks not over a thirty-thousandth part of an inch in thickness—how frequently the natural and healthy processes of development and growth begin to diverge from the "correct lines" by quantities observable only by some of the most refined instruments known to science.

All manner of meters crowd the shelves of the modern scientific worker in medicine, micrometers, spectrometers, galvanometers, hæmocytometers, thermometers, *et hoc genus omne*, the very use of which is quite an education in itself.

Has it, therefore, apparently come to this, *scientifically*, that now-a-days all the great and important facts in science (not to speak of medical science alone) have some time ago been laid bare, and that all future advance towards discovery must be made by groping about among former unconsidered trifles, much as miners work up their rubbish heaps after the lode has given out?

Or, considering *practical* aims alone, is it assumed that by carefully observed and carefully measured phenomena in their more minute physical bearings, more light is going to be thrown upon "cases" than the prominent aspects are able to reveal?

Evidently neither of these conclusions is to be taken absolutely—medicine is not yet a "science" properly so-called. In the light, however, of many recent discoveries, it is to be noted that much may be found out by searching among what, from want of knowledge, one is apt to consider unworthy of attention, from perhaps mere minuteness alone, forgetting that "big" and "little" are terms of no account when we consider the very essence of things. Of late years we have had sufficient evidence of this, in the discovery of new elements, by simply paying heed to what a short time ago was considered to come legitimately within the limits of "loss" or "accidental error," from which it is so difficult to free even the most refined researches.

Again, on the biological side, where would have been our present achievements in antiseptic survey, but for minute attention to previously unconsidered minutiæ of substance and mode of action? Since the advent of that new science Bacteriology, the micrometer has come very much more into use, although the identity of micro-organisms is seldom to be made out by that means alone.

Taking into account the very great precision of measurement necessary for the production of most of the finer appliances used in medicine, it must, I think, be evident to most people that for no single profession is there greater necessity for refined measurements at some stage or other than for that of Medicine. It has been said by those who see but small merit in science, especially of that variety known as "pure," that the greater part of a scientific man's time seems to be taken up in making and recording minute measurements, for which neither he nor any one else can ever afterwards find any practical use; and such detractors usually cite as a telling example the piles of meteorological data which at present seem of so little available purpose. These people forget (if they ever knew) that without some such accumulated labours on the part of some patient devotee—Governments have but seldom assisted in these matters—most of our present-day science would only yet have been a jumble of partly explained facts and extravagant theories.

URINARY ANALYSIS IN VETERINARY PRACTICE.[1]

BY PIERRE A. FISH, D.SC., D.V.M., NEW YORK STATE VETERINARY COLLEGE
ITHACA. N.Y.

THE urine essentially represents a solution of tissue constituents; certain of these may appear in the urine in much the same form as they appear in the food before it is digested—*e.g.*, sodium chloride. Other urinary constituents, however, are the result of active tissue metabolism, the effect of which is to break down the nutritive material brought to the tissues and the rearrangement of these products in new combination—*e.g.*, urea, creatinin, &c.

There is, perhaps, no other secretion in the animal body which varies so much in its composition as the urine. The amount of the constituents of a perfectly normal urine may therefore change within relatively wide limits without having any special significance. The analysis of urine taken from a healthy individual at different periods does not give exactly identical results. Such variations are dependent upon diet, temperature, exercise, &c., and are purely physiological in their nature.

Abnormal urine may result from the presence of abnormal constituents, as albumin, sugar, and bile, or from the presence of one or more of the normal constituents in abnormal amount.

The urine serves as an index to tissue activity. It is the key which opens the door to the tissues and reveals their purposes.

Veterinary medicine, in its beginning, was largely dependent upon human medicine; and while there is a broad similarity in these two branches, and, in general, the animal tissues react to certain drugs similarly to those of human tissues, there are some exceptions in which each species reacts in a manner peculiar to itself, and the reason for this is to be found in purely physiological conditions. So in the meagre analyses of the urine of the domestic animals at the present time the veterinary practitioner can only follow the outline in use for the examination of the human urine. There are obvious reasons why this must be done, for, so far as the writer knows, there is not at the present time in the English language any manual or set of directions devoted especially to the examination of the urine of domestic animals.

Although the majority of the tests given for the recognition of the constituents in the human urine may apply as well to that of the animals, there are differences, both qualitative and quantitative, which must be carefully considered in order to obtain anything like accurate results. There are differences in chemical reaction, odour, consistency, pigments, and constituents which may in many instances influence the results very materially.

Veterinary literature contains almost nothing relative to a careful and purely scientific analysis of the urine of the domestic animals. A painstaking search through English, French, and German literature for some years back shows that comparatively little attention has been paid to this important subject.

In human medicine the examination of the urine has become so firmly established, and has given results so important for purposes of diagnosis

[1] Read at the Thirty-seventh Annual Meeting of the American Veterinary Medical Association, Detroit, September 1900.

and prognosis, that one may reasonably inquire why these undoubted benefits may not be utilised in veterinary practice. It is evident, in the majority of cases, that the veterinary practitioner has not had the necessary experience; that he does not possess the apparatus nor the time requisite for an exhaustive or strictly scientific analysis. A mere qualitative examination, although useful for the detection of abnormal constituents, is not always sufficient. A quantitative examination has hitherto been out of the question, because, aside from the skill and apparatus necessary, a number of days would be required for a complete analysis of all of the urinary constituents.

Within a comparatively recent time new methods and apparatus have been introduced which find as ready an application in veterinary as in human usefulness. I refer especially to the centrifuge, which may now be obtained at a moderate cost, and by means of which very approximate quantitative results may be obtained in a minimum of time. For the estimation of the chlorides, sulphates, phosphates, uric acid, albumin, and urinary deposits the centrifuge is especially useful. With this apparatus but little time is required, and the information necessary for prognostic, diagnostic or clinical purposes is readily obtained.

In veterinary practice it is seldom necessary to examine the urine of any but the horse, and what follows is therefore understood to apply to this genus.

The urine may be obtained in various ways. Sometimes it is sufficient merely to pass the hand into the rectum and press gently upon the bladder; the catheter may be used (more easily in the female than in the male); or a urinal made of rubber or leather may be strapped to the horse in such a way that all of the urine may be caught.

Quantity.—The normal quantity of urine passed by the horse in twenty-four hours is from 3000 c.c. to 6000 c.c. (three to six quarts).

Colour.—The normal colour of the urine is due to pigments derived from the colouring matter of the bile. In the horse it is of a yellowish colour when first passed, but turning to a deep brown after the urine has been allowed to stand for a time, or after it has been filtered.

Transparency.—The urine of the horse is normally more or less turbid when it is passed, and it is especially so toward the end of micturition. The turbidity is due to the presence of earthy salts, chiefly the carbonates. The longer the urine remains in the bladder the more turbid does it become. The turbidity is diminished after the ingestion of large quantities of water. In other animals the urine is normally clear when it is passed, and any turbidity at that time indicates abnormal conditions. On the other hand, a clear, limpid urine in the horse is generally regarded as pathological, indicating polyuria and often showing an acid reaction.

Consistency.—In the horse the urine is very viscid on account of the contained mucus and sometimes of epithelial débris. It filters very slowly. Urine taken directly from the ureter or the pelvis of the kidney is still more viscid, having a consistency very similar to that of egg-albumin and a high specific gravity. This would seem to indicate that the urine becomes more fluid after it has reached the bladder.

Reaction.—In the horse the reaction is normally alkaline, and is due to the presence of the carbonates or bicarbonates of lime or potassium. A vegetable diet always influences the reaction in favour of alkalinity. It would appear that the salts present in the plants undergo oxidation to form

organic acids, and these in turn are transformed into carbonates, causing alkalinity of the urine. In case of fasting or starvation, the urine of the herbivora becomes acid, which is accounted for by the fact that they are practically carnivora for the time being, and living upon their own tissue.

Specific Gravity.—Normally the specific gravity ranges from 1020 to 1050, the average being 1035. It may fall as low as 1005 to 1010 in chronic interstitial nephritis, or rise to 1050 or 1060 in diabetes.

Water.—The water of the urine is derived mostly from the food and drink, and varies in amount according to the activity of the skin.

Chlorides.—The chlorides are the most abundant of any of the inorganic constituents, and are derived chiefly from the food. They are of importance clinically in that they are diminished or sometimes entirely absent in those diseases where effusions or exudates occur—*e.g.*, pneumonia. Their reappearance or increase is a favourable sign. The chlorides are also decreased in acute fevers and in some chronic diseases. They may be increased physiologically after the ingestion of salt foods and much water, and during pregnancy.

Sulphates.—The sulphates are formed from the metabolism of the proteids in the body, and are known as ordinary sulphates. Another form known as ethereal sulphates also exists, and is present in greater amount than the former. The ethereal sulphates are formed by the combination of sulphuric acid with organic radicles, such as phenol, skatol, &c., which originate from the putrefactive processes going on in the intestine. They are of importance clinically, as they indicate any derangement of the proper performance of the digestive processes.

Phosphates.—It has been claimed that phosphates do not normally occur in the urine of the horse. It is now generally held that they are present, but in small amount. In the urine of the omnivora and carnivora the phosphates abound. The food of the herbivora is rich in phosphoric acid, and that it does not appear in the urine except in such slight amounts is due to the fact that it forms salts in the intestines, with inorganic bases taken in with the food, and these salts are largely eliminated with the fæces instead of in the urine, as in the omnivora and carnivora. The phosphates exist in two forms—earthy and alkaline—the latter being more abundant. Physiologically the phosphates may be increased in the urine of the horse after a large feed of oats, bran, oil-cake, &c. Pathologically they are increased in diseases affecting the bones, as rachitis, osteomalacia, osetoporosis, and during the active period in such bone diseases as spavin, ringbone, splint, &c. They are also increased in rheumatism and diseases of the nervous system. Clinically it is of considerable importance to examine for the amount of phosphates present.

Urea.—This is the most important of the organic constituents, and represents about one-half of the total solids in the urine. It is the most important product of the decomposition of the proteids in the food. It is increased physiologically by a proteid diet, exercise, and muscular vigour, and by drinking much water. It is decreased physiologically by fasting, non-nitrogenous food, and reduction of water in the diet. Pathologically urea is increased in all acute fevers, dyspnœa, diabetes, and phosphorus-poisoning. It is decreased in uræmia and in many chronic diseases. In general, any disease which interferes with the activity of the liver decreases the urea. Disease affecting the uriniferous tubules causes an appropriation of the urea from the blood and passes it on into the urine. Some

medicines which increase the amount of urea are :—common salt, colchicum, atropine, cantharides, ammonium chloride, coca, and salicylic acid. Some which decrease the amount of urea are :—digitalis, alcohol, caffeine, the iodides of sodium and potassium, potassium bromide, arsenic, turpentine, and quinine.

Uric Acid.—This nitrogenous constituent is present in small amount in herbivorous urine, although commonly said to be absent and its place filled by hippuric acid. The latter is present in much larger amount. In omnivora and carnivora the reverse is the case.

Indican.—This substance is derived from indol, one of the putrefactive products formed in the intestine. It is said to exist normally in the urine of the horse to an amount twenty times as great as that found in man. Indican is of considerable clinical importance; an increase is indicative of an imperfect performance of the digestive processes. In cases of obstruction of the intestine the increase in the amount of indican is enormous.

Thus far only certain of the normal constituents of the urine have been considered. A knowledge of their presence in normal or abnormal amount in certain diseases is of the highest importance for clinical purposes. Among the important abnormal constituents found in the urine are albumin, sugar, bile, blood, melanin, &c.

Albumin.—The presence of this substance in the urine is regarded as pathological. According to some, there may be a physiological albuminuria for a short time, after a diet containing much albumin, or after violent exercise. The principal form of albumin present is serum-albumin; in addition there may be serum-globulin, acid-albumin, albumose, or peptone. There are special tests for distinguishing each variety, but to the practitioner the ordinary tests for albumin are sufficient, for in whatever form the albumin may be it indicates an abnormal state of affairs, and proper treatment should be administered. Fundamentally, a change in the character of the blood, a disturbance of the circulation with regard to blood-pressure, or a change in the kidney itself with respect to the epithelial cells of the uriniferous tubules, or of the glomeruli, thereby affecting transudation, account for the presence of albumin in the urine. Pathologically, albumin may appear as a result of suppression of cutaneous perspiration, in pulmonary and cardiac diseases, febrile and inflammatory diseases, lesions or prostrations of the nervous system, hydræmia and ailments that disturb the vascular tension, diseases of the genito-urinary system, and after the use of such agents as copaiba, cubebs, turpentine, and also some emetics and drastic cathartics and some anæsthetics; also poisoning by phosphorus, iodides, and iodoform.

Sugar.—Dextrose or glucose exists normally in the blood in the proportion of one or two parts per thousand. When a greater amount than three parts per thousand exists, the excess is excreted through the kidneys. Sugar in the urine does not necessarily point to disease of the kidney or urinary organs, but rather to the liver, indicating that its glycogenic function has been disturbed. In diabetes, the kidney in ridding itself of dextrose becomes irritated, and this irritation extends down the entire canal, thus producing a real polyuria.

Physiologically, sugar may be found in the urine during pregnancy and lactation. Pathologically, sugar is found in diabetes, in impeded respiration from pulmonary diseases, in impeded hepatic circulation due to functional and organic diseases of the liver, and in certain diseases of the

nervous system; also from the action of certain poisons, as carbon monoxide, arsenic, chloroform, and curare. The specific gravity is high and the colour is usually pale, from the dilution—not diminution—of the urinary pigments. Albumin interferes with the tests, and should be removed in all cases.

Bile.—In certain pathological conditions the elements of the bile are excreted in the urine. The pigments biliverdin or bilirubin may occur along with the bile-salts, or the bile-salts may occur alone. The urine is generally of a greenish or yellowish brown colour, and froths easily. In cases of jaundice, functional or organic diseases of the liver, bile may be looked for in the urine.

Hæmaturia, or blood in the urine, may have its source from lesions in the kidney, as in acute nephritis, or in the ureters, bladder, or urethra. Blood may be detected by certain chemical tests, also by the use of the spectroscope and microscope.

Melanin.—Melanin may exist in solution in the urine, but may sometimes appear in the form of a brownish or black sediment, recognisable by the microscope. An examination for this substance possesses diagnostic significance when the melanosis is beyond the reach of examination by the eye or by touch. It may disappear from the urine when the disease is arrested, or it may remain stationary. The practical significance of this condition (melanuria) is limited by the fact that the urine may contain melanin in wasting diseases, and that obtained from patients suffering from melanotic cancer may be entirely free from it. Nevertheless, as an adjunct in diagnosis, an examination for this substance is of undoubted utility.

It has not been the purpose of this paper to offer any scheme or set of directions for the analysis of herbivorous urine, but rather, by calling attention to certain constituents of the urine and the changes they may undergo qualitatively or quantitatively, to show the importance of this subject in the diagnosis and prognosis of disease, the information thus obtained oftentimes being more available and of more direct use than clinical symptoms.

A REVIEW OF A REVIEW.

(*Continued from our December No.*)

TREATISE No. 2, which was read in summary by M. Mollereau, was written by M. Joly, Chief Veterinary Surgeon of the 7th Dragoons, and had for its title "Studies on the Osteitis of Fatigue." The first section treats of splints. M. Joly shows that, besides the inter-metacarpian splint, there frequently exist others, situated on the posterior border of the rudimentary metacarpian in the space comprised between the half and the lower third of their length; he has called them post-metacarpian or aponeurotic. These splints are observed specially on young horses undergoing training, and are due to the "clacking" of the post-metacarpian arcade. After giving a description of this arcade, he states under what conditions violent strains may be produced. On these points of attachment, and the formation of splints being brought about, M. Joly has some new ideas on the pathogenesis of the inter-metacarpian splints; these he thinks are due to the dragging on the metacarpians exercised by the metacarpian arcade in its excessive extension.

In his second section M. Joly treats of spavin, hard tumours, tetters of the hock, mobility of the skin and of the tendons, the transverse nerve of the tendons. Regarding spavins, M. Joly divides into four phases the pathological processes which show themselves according to the period of evolution of this lesion, and which correspond successively—(*a*) first phase, to a dry arthritis of the lower tarsal articulations (arthritic spavin); (*b*) second phase, to an ankylosis of the inflamed articulations (ankylosed spavin); (*c*) third phase, to an exostosis localised by the anatomical constitution of the hock on the inner side of the base of the articulation (exostose spavin); (*d*) fourth phase, the disease has got beyond the lower tarsal articulations, and invaded the precincts of tarso-metatarsal and superior tarsal articulations (encircling spavin). Having made this division, the author describes the symptoms of spavin, and insists particularly on the dropping of the hip. Enumerating the known causes of spavin, he places heredity first: what is hereditary is "the tendency to too early solidification of the bones of the horses, a solidification eminently favourable to the development of dry ankylosing arthritis of the articular planes." Under the name tetters (*dartre*) of the hock, he designates the wearing away of the skin, the depilation or excoriation which often exists in the hollow of the hock of a standing horse. This lesion is due to a wound which results, during sternal decubitus (or resting on the breast), from compression of the skin between a bony protuberance and the ground. M. Joly gives the following demonstration:—If, on a corpse recently dead, we stick a pin in the skin of the flexed hock at the top of the lower tuberosity of the tibia, and if we then stretch out the limb, we notice that the lower tuberosity of the tibia has been removed 10 centimetres (about 4 inches) from the pin, and that the pin would occupy the hollow of the hock if the animal were standing. The cause being thus determined, it is sufficient, in order to obtain a cure, to provide the horse with abundance of litter.

If the skin of the hock possesses great mobility, the same is the case at the level of the canon and the tendons, and this can easily be verified by the same proceeding. From the surgical point of view the mobility of the skin in these regions is important as explaining, says M. Joly, the failure of the operation for so-called "capped knee." He says:—"On horses recently wounded the lesions of the deep tissues do not correspond to the cutaneous lesions, being situated a few centimetres below the latter, and thus there ought to be complete immobility of the articulation in its normal extension during and after every operation in this region. In point-firing also the limbs ought to be kept stretched out motionless in the position which they occupy in the standing animal. M. Joly has likewise studied the movements of the flexor tendons of the phalanges, and the results which he has obtained authorise him in concluding that these tendons play easily on one another and are completely independent in their modes of action. The action of the perforate is quicker, abrupter, and less enduring than that of the perforans; it is therefore natural that the strain of the perforate should be frequent, and that it should be brought about by violent work.

M. Joly is of opinion that ankylosing arthritis of the tarsus and osteo-arthritism in general are hereditary. In the development of ankylosing osteo-arthritis of the pastern he recognises three principal stages—(*a*) osteo-arthritis without ankylosis or exostosis; (*b*) osteo-arthritis with exostoses and without ankylosis; (*c*) osteo-arthritis with exostoses and ankylosis. He

states that fractures of the pastern without apparent cause are due to the ostitis of fatigue, and in justification of this opinion gives a clinical report of a mare which fractured her pastern whilst galloping about at liberty; at the post-mortem he found lesions of osteo-arthritis of the coronal articulation and of rarifying ostitis on the second phalange. Cartilaginous tumours on the pastern, apart from wounds and injuries which often bring about their evolution, have most frequently for determining cause ostitis of fatigue in animals predisposed by heredity or ostitism to contract these lesions. In horses presenting skeleton defects, as soon as they are put to work, there are found frequently malformations of the hoof; they become hoof-bound or foundered, but these are only manifestations of ostitism. In such animals the anterior aspect of the third phalanx presents lesions of very distinct rarefying ostitis.

In the discussion which followed M. Cagny said that M. Joly was right in insisting on ostitism of the knee. Cases of this kind were of daily occurrence in young race-horses; it might even be said that in every racing stable there are amongst the younger animals (say from 18 to 36 months) a good number whose knees are being subjected to treatment, douches with astringent applications, painting with tincture of iodide, blistering, cauterisation. One may observe synovial dilatations of the lower part, inside or outside, or internal exostoses; most frequently there is only a little heat and a difficulty in walking. In the majority of cases the cure effected is sufficient to allow the animal to be trained. He is said to have "weak knees," for generally the injury exists in both limbs.

"DOPING."

THE question of "doping" is of great importance. The term as first applied in America meant that the administration of a "dope" would either improve the speed of a horse, or would, without any recognisable reason, cause him not to run up to his usual form. In consequence of this it was and is possible to run a horse "not up to usual form," "in his usual form," and "at the top of his form." At one time horses were "doped" by having certain substances injected at the back of the shoulder, but as the injection frequently caused a tell-tale patch of sweat there, it is now often made just under the mane, or is otherwise administered. The term "doping" is now in America being extended to what is known as "faking" in this country, and of which there are various manners, and these are applied to all kinds of animals, particularly those entered at shows.

THE "HIGH-STEPPING DOPE."—The late New York Horse Show threatened to unearth a scandal by investigating an exhibitor's methods of producing knee action in his horses. The suspicion grew out of the peculiar conduct of his entries in the ring, and was further strengthened by a strong odour of ammonia emanating from the stalls occupied by these horses. The official veterinarians were sent upon an investigating tour, and they reported that the explanation furnished by the stable was to the effect that the ammonia was contained in a leg wash applied for soothing

and antiphlogistic purposes, and was only one of a number of ingredients of which witch hazel, alcohol, and arnica were the others, and that the ammonia was in such small proportion as to be devoid of irritating effects. The veterinarians were disposed to accept this statement as correct, but thought the odour of ammonia was stronger than was justified by the small quantity claimed. The gentleman owner thinks the Association owes him an apology for the reflection. The directors have clearly the right to investigate anything which may seem to them suspicious, and it is their duty to do so. The fact that the suspicion was not confirmed is equivalent to an exoneration. Veterinarians do not believe that it is a practice among a certain class of horsemen to rub the legs of their horses with irritants to cause them to lift their feet high, showing knee action and animation. It is impossible that an irritant could be applied which would have such effect while the horse was in action, and fail to affect him while standing at rest for inspection by the judges.—*American Veterinary Review.*

A PRELIMINARY REPORT UPON FORAGE-POISONING OF HORSES (SO-CALLED CEREBRO-SPINAL MENINGITIS).

BY LEONARD PEARSON, B.S., V.M.D., VETERINARY DEPARTMENT, UNIVERSITY OF PENNSYLVANIA.

THE disease of horses commonly known as cerebro-spinal meningitis has long been supposed to result from the ingestion of food that has undergone fermentation or putrefaction or has become mouldy. The evidence in favour of this view has, however, never been of a direct but only of a circumstantial nature. While the disease has in many instances occurred on farms and in stables where horses were fed on mouldy or musty grain or ground feed, damaged hay or spoiled ensilage, and it has been assumed that such foods produced the disease, there has always been a lack of proof, first, that these foods were poisonous, and second, that some other influence had not produced the disease. This absence of proof is due to no lack of efforts to fix the responsibility on suspected food-stuffs. Experiments have been made in large numbers in which suspected materials have been fed to horses in the attempt to produce the disease called cerebro-spinal meningitis, but all of these trials have resulted negatively. So far as the literature of this subject shows, cerebro-spinal meningitis, so-called, has never been produced artificially or under experimental conditions.

Friedberger and Fröhner state (*Specielle Pathologie and Therapie*, 1896, fourth edition), in connection with the discussion of mould-poisoning, that feeding experiments are usually without result; but, they add, that it is illogical to conclude from this, in the face of the clinical evidence, that moulds do not have pathogenetic properties. They do not cite any experiments to show that mouldy foods are dangerous; all of their evidence appears to be clinical.

Case.—On October 29th, 1900, I was asked by Dr. Francis Bridge to see with him a stable in which five horses had died of cerebro-spinal meningitis, so-called. The purpose of the consultation was to determine if possible the origin of the disease.

It was found that the horse stable consisted of a row of seven stalls across one end of the stone basement of a large barn. One long side of

the basement was against an embankment and had no windows. The other long side was protected by an overhang. There were windows under the overhang and in each end of the barn. In front of the row of horse stalls and running at right angles to it were two rows of cows with stalls for about forty animals. There were two silos on the embankment side of the stable. The silage was thrown down into a dark room, formerly used as a root-cellar, opening into the stable at about the middle. The partition between the part of the stable occupied by the cows and that occupied by the horses consisted of the front of the horses' mangers. This did not extend above the level of the feed-boxes.

A silo had been opened about one week before the first cases developed. The silage was somewhat mouldy on top and had a musty odour. This condition extended down around the sides for several feet. No silage was known to have been fed to the horses, although some could get on their hay, which remained for a time, after it was thrown down from the loft, in the passageway in front of the cows. It was also possible that some of the milkers may have fed a little silage to the horses.

The hay fed to the horses was of good quality and in good condition. The concentrated feed was a mixture of oats, corn, and bran, and appeared to be in good condition. It was kept in a covered feed-bin in the passageway between the horse mangers and the cow stalls.

All of the seven horses in the stable became weak, showed muscular tremors, difficulty in chewing and swallowing, and gradually progressive paresis, which terminated in death in five instances. The other two horses were removed to another barn and recovered. The duration of the disease was from two to four days. No autopsies were made.

Suspecting the silage, on account of experience in previous outbreaks and on account of the very mouldy condition of some of it, I obtained a sample and took it to the Veterinary Hospital of the University of Pennsylvania for trial. For the trial a nine-year-old gelding was used that had been in the hospital for two months. This gelding had been quite stiff from osteoporosis, but had recovered largely from his lameness, was well nourished, vigorous, and in good general condition.

The feeding experiment started on October 30th, and continued until November 2d. The horse ate altogether approximately one-half bushel of silage mixed with oats and bran. November 2d he ate and swallowed slowly and with some difficulty. His temperature was 100° F. There was no evidence of pain. November 3d, there was well-marked paresis of the throat and of the muscles of mastication. The temperature was 100·5 F. There was twitching of the muscles of the flank and shoulder, desire to lie down much of the time, and some difficulty in rising. The inability to swallow continued, and the general muscular weakness progressed. In the evening the horse was unable to stand. The brain was clear. There was no pain. The horse died at nine A.M., November 4th. Autopsy negative except for swelling and dark red, almost black, colour of mucous membrane of pharynx and glottis. The mucous membrane of the larynx was congested, the mucous membrane of the stomach was also much congested and showed some ecchymotic spots on soft mucosa. The stomach contents had a putrid odour. A bolus of partially chewed hay was lodged between the teeth and cheek, and this had a very putrid odour.

There appeared to be an excess of cerebro-spinal fluid. The brain and cord and their meninges were normal.

Another horse, a gelding ten years old, with ringbones on both front pasterns, but otherwise healthy, was given on November 5th four gallons of water that had percolated through a bushel of silage. November 6th he was given three gallons of water from the same silage. November 8th he was given six quarts of silage. November 9th he was offered four quarts of silage, but did not eat more than half of it. Up to November 9th in the afternoon no abnormal condition was noted. It was then observed that he chewed and swallowed slowly. In the evening there was a little tremor of the muscles of the shoulder and partial paralysis of the throat, but he could drink very slowly. He laid down most of the time and was weak. Temperature 98·2° F. No pain. November 10th the horse was found dead in his stall, having died during the night. Upon autopsy lesions similar to those described above were found, but all were less well marked. Other investigations in this connection are now being made, and will be reported later.

As to the name that is usually applied to this disease—*i.e.*, cerebro-spinal meningitis—it is evident that the name is inappropriate, because there is no evidence of inflammation in the meninges of the brain or cord. Since this disease closely resembles the sausage-poisonings and meat-poisonings of man and the carnivora, and since the observations recorded above show that the as yet undiscovered infectious or toxic principle resides in the food, I wish to suggest the name "forage-poisoning" as one that would be descriptive and accurate.

VETERINARY EDUCATION.

REPORT OF DR. KITT, PROFESSOR AT THE VETERINARY COLLEGE, MUNICH, PRESENTED AT THE LAST INTERNATIONAL VETERINARY CONGRESS.

THE complaints that are made in relation to the insufficiency of veterinary education are assuming an important part in the history of our schools.

A century ago, at the time of the creation of the first veterinary schools, von Humboldt, Cothenius, and von Voit had made out a list of the requirements which they thought necessary to those schools. But in very few of them this programme has been completely carried out; for the majority, it has remained incomplete, and many had to give up the attempt.

More than one school has gone down, because of the want of such organisation, and many that have lived are still suffering and are in want of necessary improvements. Reorganisation has often been attempted, but generally a change from the supervision of one ministry to that of another is all that was gained. Some innovations, some useful improvements have at times been realised by these attempts at reorganisation; but often they were stopped short or were made so slowly that they were never equal to the requirements of scientific progress, and students could not be educated as they should be. For the last twenty years most of the veterinary schools have got the rank of faculties, and it must be acknowledged that many improvements have been introduced by the increase of the teaching staff and the improvements in the material of education. But that is not suffi-

cient. The rapid and enormous progress made by veterinary science, the extension of the curriculum and programmes of studies imposed on veterinary students, the numerous investigations that remain to be made upon epizooties, the means to control them, the inspection of meat, all show the insufficiency of the existing institutions in most countries.

Veterinary journals have often called attention to what seems to them as wanting in the present system of professional teaching or inviting criticism. But it is impossible to mention here all the faults and wants, as they are not alike everywhere. The teaching staff of these colleges is better able than anyone to judge to what extent some institutions necessary to the most thorough education of students depend on their circle of action; and naturally they will try to improve or create them. Anyhow, some veterinary colleges are far ahead in that direction in comparison with others, and possess facilities which distinguish them among all. On this point, it is interesting to notice how veterinary institutions in Austria, to which medical teachers are attached, have succeeded in imposing on their candidates, first the obligatory degree (bachelor of sciences and of letters), then an excellent curriculum of studies, and finally, a university examination. In Hungary, a certain number of students are obliged to make a stage of several months in large agricultural establishments to learn practical zoology, the breeding and raising of animals, and obstetrics. I consider this as essentially useful to young veterinarians. In other veterinary schools studies have been introduced with the object of completing and increasing the knowledge of future veterinarians. They deserve imitation. In Dresden, for instance, students follow a course on agriculture. In Munich, there is a course on pisciculture, much patronised by veterinarians. In Berne, there are among the services of the school an ambulant clinique and a very extensive course of bovine pathology. In Copenhagen, veterinary education has reached the highest degree, thanks to Professor Dr. Bang, who succeeded in uniting the veterinary school to that of agriculture. Professional journals, the published works, the annual official reports, show what amount of good and solid work is done by the French schools and also the progress that veterinary studies and practice are making in Sweden, Norway, England, America, and Japan.

Having indicated the advantages and facilities of different schools, I shall consider the wants of others. At all events, these have frequently been the object of various proposals and have already been often discussed. I will recall on this subject the excellent paper of Professor J. Feser on the necessity of reforms in veterinary education in Germany, and also the learned and complete study of Dr. Lydtin upon the work and importance of veterinarians of our days, and finally the history of veterinary science, written in such a masterly and careful manner by Professor Dr. Eichbaum.

I will briefly mention the following particulars:—

(1.) *Obligatory degree of bachelors for veterinary students and extension of the length of studies.*

(2.) *University organisation of veterinary colleges; election of a rector by the staff of professors; creation of a sufficient teaching staff; admission of adjuncts (Privat-Docenten), recruited among assistants, official or military veterinarians, whose ability shall be recognised according to university methods.*

(3.) *Introduction in the curriculum of a course on agriculture, with practical demonstrations and afterwards a stage of several weeks*

in a model farm, a stud, or in abattoirs. (*This stage would take place in the eighth semester.*)

(4.) *Encouragement of experimental methods, and especially the creation in veterinary schools of well-appointed institutions devoted to the study of contagious diseases. I will return to this further on.*

I have already written on this subject and expressed my opinion in the "Monat-Schriften für praktische Tierheilkunde, 2°"—therefore I am obliged to repeat myself somewhat here.

It is principally the enormous losses produced directly or indirectly by contagious diseases of animals that have induced States to create veterinary schools. The study of epizootic diseases and the means to control them have been and are yet among the principal duties of the veterinarian.

This study was begun and will be successfully continued in many respects, on one side by the practitioners who, gathering their observations and their experience, laid the first foundation of veterinary sanitary police; and on the other, by the professors of the school, who introduced experimental methods. The progress of human medicine and the natural sciences has allowed the discovery of the nature of a great number of contagious diseases. Specially for the last twenty years, the admirable works of Koch, Pasteur, Behring, Bang, Nocard and Roux, and their pupils, have allowed important discoveries to be made. But those labours were done almost always in institutes of pathology and of hygiene, in universities or great laboratories, created specially for the study of infectious diseases, with a staff recruited most ordinarily among physicians and chemists. Those institutes being richly endowed, and placed under the control of a renowned scientist, attracted numerous experimentators who, having no other obligations and being little or not at all prevented by their duties as teachers, were able to give themselves entirely to their researches. With proper distribution of the work, it may be possible, in such conditions, to obtain a serious knowledge of numerous details, which, collected together, result in the solution of important questions. Thus, more and more, a displacement has taken place in the direction of the researches undertaken at those institutions, which from the beginning had made it their object to consider diseases of man, and which now are principally occupied with researches relating to contagious diseases of animals, while in veterinary schools, from want of proper organisation, experiments and studies of epizootics are restricted to what is strictly indispensable to the education of the students. I do not make this comparison from motives of professional egoism, and I do not wish to say that representatives of veterinary medicine alone have the right to make those researches. Far from it. On the contrary, the work made in common is for me far superior to any separative tendencies; medicine of animals cannot do without the theories and results of human medicine, and since its creation she has had to borrow for almost all its branches from the other sciences.

Natural sciences are the source from which all technical professions draw. Human medicine has been and remains the guide of veterinary medicine, as is shown by our classical works, our journals, and every page of our professional history; but in following the same road, veterinarians have proved by their own observations and independent work, that they, too, are scientific men, and that their professional knowledge must be taken into serious consideration. This exchange is specially necessary for

the study of contagious diseases of animals and their means of controlling them, as well as for the teaching of veterinary medicine in general. The great number of experiments relating to contagious diseases of animals that have been made in institutes and universities, the conclusions arrived at on the action of pathogeneous germs upon the animal organism, from the point of view of contagious diseases of man, show the importance of the subject for the solution and elucidation of questions of interest common to both branches of medicine. At any rate, from the moment when the facts established by bacteriological institutions entail the domain of practice, the assistance of veterinarians is generally necessary, because bacteriologists and physicians, if they are ignorant of the special facts of veterinary medicine, will often make mistakes in their conception of symptoms, and in their ideas upon the conditions of infection, the importance of prophylactic measures, &c. For these reasons, veterinary collaborators have become adjuncts to institutes of bacteriology. But veterinarians must also be acquainted with the scientific points of view that are arrived at in the laboratory and by way of experimentation. But it is evident that such work must be done from the beginning and during the entire duration of the studies, and therefore must be carried on at college. Moreover, Professors in our colleges cannot be satisfied with speaking *ex cathedræ* of discoveries and experiments made by others and of their theories; they must, before all things and always, give to their teaching a demonstrative form, as the natural history of contagious diseases, their clinical and anatomical forms, cannot be taught by books or notes. The Professor who wishes to fill his mission well, must be acquainted with all the technical part of laboratory work, he must, by repeated observation of cases of disease and by experiments of his own by way of controlling those of others, have acquired sufficient personal knowledge, not to appear before his listeners merely as one who repeats a lesson. Veterinarians, whose mission it is to recognise rapidly contagious diseases of animals, and struggle with effectiveness against them, should already, during their time of study, receive practical instruction, which cannot be obtained except in institutes specially devoted to the study of those diseases, perfectly organised and forming part of veterinary colleges.

Contagious diseases are sometimes rare, and it occasionally happens that one or another does not appear for many years, and consequently cannot be the subject of clinical observations. How many veterinarians are there who, while at college, did not see a case of anthrax, swine pest, rabies, chicken cholera, &c.—knew them only by their readings, and never had an opportunity to study them otherwise. If later in their career they are brought in presence of one of those diseases, their doubts must necessarily influence their actions; besides, this want of knowledge may be injurious to them and others.

A station for contagious affections would be a very useful addition to the hospitals of veterinary schools, if it were organised to create at will, by vaccination, cases necessary to the demonstration, for instance, of anthrax fever, symptomatic anthrax, glanders, tetanus, rouget, porcine pest, chicken cholera, various forms of septicæmia, of tuberculosis, rabies, mammitis, cowpox, strangles, gastromycosis of sheep, intoxication by meat, &c.

The objection that diseases produced by experimental inoculations do not resemble those by direct contagion, is not exact. For if the natural mode of infection is closely followed, the desired progress of the disease will

be realised. Whoever has seen post-mortems, altogether classical, of animals inoculated for instance with anthrax fever (by injection), with symptomatic anthrax, with the various forms of septicæmia, and has also witnessed the symptoms of mammitis, rabies, tetanus, rouget, swine pest experimentally developed, has been able to assure himself that the alterations were identical with those of animals naturally affected. It is true that there may be modifications and atypical manifestations in some cases of inoculation; but these are themselves instructive, natural infection also presenting numerous variations. Education will benefit by the examination of such cases.

The new means to facilitate the diagnosis of contagious diseases and the technics of preventive vaccinations would remain unknown to veterinarians, if the various methods of experimentation were not already taught in veterinary colleges.

Courses of micrography, bacteriology, and pathological anatomy are complete only if they include experiments on animals.

The student ought to learn how to make preparations of the bacillus of anthrax, of that of Koch, of rouget, of swine pest, strangles, septicæmias, and meat intoxications. He must make the preparations himself, and not look at them only through culture-glasses; he must also learn how to look for them in cadavers, and learn to understand how contagious diseases develop. All this cannot be learned except by experiments on small and large animals. A course of teaching on contagious diseases without those indicated demonstrations will soon drop to the level of simple literary lectures. One cannot think of physiology without experiments, of anatomy without dissection, of chemistry without analysis, of botany, clinics, pathology without demonstrations. All these branches include practical teaching of their subject, and certainly in our days a course of contagious diseases cannot be given without demonstrative experiments. It seems so natural, that it is usual to insist.

Presumably the objection will be made, that the proposed institutions might become a threatening source of contamination for the surroundings, a permanent centre of contagion in the middle of a town or a country, and that foreign diseases, at present stamped out, would be artificially kept up, and might be propagated beyond their proper limits. Certainly, the experimentalist is very liable to become himself infected with diseases transmissible to man, but physicians and veterinarians are daily exposed to the same danger, when treating children suffering from diphtheria, or persons affected with typhus, and when examining glanderous horses or rabid dogs, &c. These dangers like the infections following parturitions or autopsies, are professional risks. And it is just in those proposed institutes that people will learn how to avoid these accidents of infection, and how to put the keepers and owners of animals on their guard against these dangers.

Institutions connected with contagious diseases ought to be isolated and separated. Being erected in cities, they are far from agricultural establishments, and such a situation gives the greatest security; the animals that are brought to the station do not leave it any more, and when dead are destroyed and disposed of, together with any infectious matter they may contain, with careful use of disinfectants. Directors of stations, knowing their responsibility, will know at all events how to reduce the danger to the neighbourhood to its minimum, by watchful supervision and prudent care, and also in putting a stop, if required, to too risky experiments. The

direction of the existing institutes, in which quantities of dangerous contagious matter are daily handled, sufficiently shows the truth of the above remarks.

Institutes for contagious diseases are the best places for the isolation of animals suspected of contagious diseases. If in a district an animal is declared suspect and transferred to the institution, then not only all agricultural or other establishments will be protected from all danger of epizooty, but besides, the special arrangement of the institution and the well educated staff will considerably facilitate the observation of the animal and the execution of the sanitary measures.

In the proposed institutions, it will be necessary, according to the requirements of the course and following a definite plan, to make experiments, whose object will be to find preventive and curative means against contagious diseases; to improve and control those already known, to decide on the processes of disinfection, to study the modes of spreading of epizooties, and teach the means of diagnosis. The advantages to be derived from those institutions are:—

1. Scientific and practical education upon all that relates to epizooties, general pathology, and pathological anatomy.
2. The correct and rapid diagnosis of contagious diseases.
3. The control of the products sold in commerce and used for the prophylaxy of, or recovery from, those diseases or for disinfection.
4. The preparation and sale of the substances employed to assist diagnosis, or for preventive inoculation.
5. All researches relating to contagious diseases, to meat inspection, and hygiene.

The creation of such institutions would besides offer to many veterinarians the possibility of undertaking special detail works. The object of veterinary schools is to form practitioners and not learned men only. But for practitioners also, a closer participation in scientific work is of great value.

The scientific extension of veterinary medicine is in proportion slower than that of human medicine, on account of the more limited number of workers. For this reason, a great number of questions have not yet been submitted to scientific inquiry.

Veterinarians who, by a long sojourn or repeated stages in scientific institutions, have improved their knowledge in bacteriology, pathological anatomy, and on the subject of contagious diseases, will be able to work scientifically by themselves, they will do it and still answer all the exigencies of their private or administrative career. It is among a staff, so well qualified, that veterinary and agricultural schools will find their professors of bacteriology, hygiene, pathological anatomy, of contagious diseases, and of sanitary police.

In the programme of questions relating to the education in veterinary colleges stands that of *the creation of chairs of comparative medicine. From my point of view, this is absolutely superfluous*, for the reason that all the branches of veterinary medicine are taught in comparison with the corresponding ones of human science. The professor of pathological anatomy can only teach by comparison, the clinical physician, the professor of obstetrics, the pharmacologist, are more or less obliged to mention analogous conditions in man; the course on bacteriology and contagious

diseases cannot be held without referring to human pathology; the professors of anatomy, histology, veterinary obstetrics, are also obliged to make comparative demonstrations of the human body and of that of the different types of animals. It will be difficult to find a single person possessing all this knowledge, and able to teach it; and it is to be feared that the course of comparative medicine, without counting the number of lectures it would require, will prove but a complication of subjects already treated by specialists and presented to students elsewhere and more consecutively.

I believe that it is more necessary, advantageous, and desirable to relieve some professors, by the appointment of adjuncts in our colleges. They could extend the teaching of detail. This innovation has for some time been in preparation at the veterinary college of Munich, and promises to give veterinary science men of ability and active and zealous investigators.

MEAT INSPECTION.[1]

BY ALFRED HOLBURN, M.R.C.V.S., CHIEF VETERINARY INSPECTOR, CORPORATION OF MANCHESTER.

THE statutory provisions which regulate matters relating to unsound meat in England and Wales, outside the Administrative County of London, are contained in the Public Health Act, 1875, sections 116 to 119, and the Public Health Amendment Act, 1890, section 28.

PUBLIC HEALTH ACT, 1875.

Section 116.—Any Medical Officer of Health or Inspector of Nuisances may at all reasonable times inspect and examine any animal carcase meat poultry game flesh fish fruit vegetables corn bread flour or milk exposed for sale, or deposited in any place for the purpose of sale, or of preparation for sale, and intended for the food of man, the proof that the same was not exposed or deposited for any such purpose, or was not intended for the food of man, resting with the party charged; and if any such animal carcase meat poultry game flesh fish fruit vegetables corn bread flour or milk appears to such medical officer or inspector to be diseased or unsound or unwholesome or unfit for the food of man, he may seize and carry away the same himself or by an assistant, in order to have the same dealt with by a Justice.

Section 117.—If it appears to the Justice that any animal carcase meat poultry game flesh fish fruit vegetables corn bread flour or milk so seized is diseased or unsound or unwholesome or unfit for the food of man, he shall condemn the same, and order it to be destroyed or so disposed of as to prevent it from being exposed for sale or used for the food of man; and the person to whom the same belongs or did belong at the time of exposure for sale, or in whose possession or on whose premises the same was found, shall be liable to a penalty not exceeding £20 for every animal carcase or fish or piece of meat flesh or fish, or any poultry or game, or for the parcel of fruit vegetables corn bread or flour or for

[1] This Paper applies to meat inspection in England and Wales under the Public Health Act, 1875, and the Public Health Amendment Act, 1890, but London and Scotland are governed by special Acts, which may be more or less different according to circumstances.

the milk so condemned, or, at the discretion of the Justice, without the infliction of a fine, or imprisonment for a term of not more than three months.

The Justice who, under this section, is empowered to convict the offender may be either the Justice who may have ordered the article to be disposed of or destroyed, or any other Justice having jurisdiction in the place.

Section 118.—Any person who in any manner prevents any Medical Officer of Health or Inspector of Nuisances from entering any premises and inspecting any animal carcase meat poultry game flesh fish fruit vegetables corn bread flour or milk exposed or deposited for the purpose of sale, or of preparation for sale, and intended for the food of man, or who obstructs or impedes any such medical officer or inspector or his assistant, when carrying into execution the provisions of this Act, shall be liable to a penalty not exceeding £5.

Section 119.—On complaint made on oath by a Medical Officer of Health, or by an Inspector of Nuisances, or other officer of a local authority, any Justice may grant a warrant to any such officer to enter any building or part of a building in which such officer has reason for believing that there is kept or concealed any animal carcase meat poultry game flesh fish fruit vegetables corn bread flour or milk which is intended for sale for the food of man, and is diseased unsound or unwholesome, or unfit for the food of man; and to search for seize and carry away any such animal or other article, in order to have the same dealt with by a Justice under the provisions of this Act.

Any person who obstructs any such officer in the performance of his duty under such warrant shall, in addition to any other punishment to which he may be subject, be liable to a penalty not exceeding £20.

Public Health Acts Amendment Act, 1900.

Section 28.—(1) Sections 116 to 119 of the Public Health Act, 1875 (relating to unsound meat), shall extend and apply to all articles intended for the food of man, sold or exposed for sale, or deposited in any place for the purpose of sale, or of preparation for sale within the district of any local authority.

(2) A Justice may condemn any such article, and order it to be destroyed or disposed of, as mentioned in section 117 of the Public Health Act, 1875, if satisfied on complaint being made to him that such article is diseased, unsound, unwholesome, or unfit for the food of man, although the same has not been seized as mentioned in section 116 of the said Act.

Similar powers of seizing and condemning horse flesh intended for human food, unless sold as horse flesh, are provided for in the Sale of Horse Flesh Act, 1889. The powers given here are more for the prevention of fraud than for the protection of health, as no mention is made as to diseased meat. This, however, is covered by the Public Health Acts.

An analysis of these sections will show that—

(1.) Outside the Medical Officer of Health, the Meat Inspector must first of all be appointed an Inspector of Nuisances under and

for the purposes of the Public Health Acts by the Local Authority.

(2.) The significance of the terms diseased, unsound, unwholesome, or unfit for the food of man, requires to be understood and determined by the Meat Inspector.

(3.) It is necessary in seizing meat to define whether it is sold, exposed for sale, deposited for sale, or in preparation for sale, and intended for the food of man, and prosecutions have been lost on account of charging a man with one thing when he did another.

(4.) Meat seized is not legally condemned until it is condemned and an order signed for its destruction by a Magistrate. (An exception to this rule is made when the owner of the article seized or condemned gives a certificate or note to the Inspector that he unconditionally gives it up to him on account of being unfit for human food.)

The Justice condemns the meat simply upon his own view and smell thereof. The condemnation is not conclusive evidence that the food was bad, and the party summoned is at liberty to show that the Justice was wrong in condemning it.

The part played by the Meat Inspector therefore is necessarily one of no small importance. The appeals made to him are—

(1.) The public require protection from food poisoning, whether bacterial infection, septic intoxication (ptomaine poisoning), or unwholesomeness of diet.

(2.) The Justice is dependent upon sound advice before signing the order for destruction.

(3.) The party charged desires fair play, that is to say, the condemnation of all diseased and unwholesome food, but not the confiscation of sound meat as a matter of course or by way of experiment.

With respect to these principles, we are bound to study meat inspection from a scientific aspect, which is the only way that any guarantee of safety can be attached to the undertaking. From what has been already said it may be gathered that meat inspection forms a part of preventive medicine, of which the basis is a knowledge of the natural history of disease. For the investigations as to the causes of disease we are chiefly indebted to our pathologists. They have shown us that certain organisms cause certain diseases, and that animals may serve as the hosts of these organisms; hence, in seeking for the source of disease in the human subject the inquirer is led to study disease of the lower animals. Every one knows that meat is diseased in consequence of disease in the animal from which it was taken, so that evidences of disease as manifested in the living and dead animal should be understood by the inspector.

Meat inspection, therefore, is neither more nor less than applied pathology. It is not learnt by examining sound animals, but taught in the post-mortem room and the laboratory. It is in the examinatfon of diseased animals and carcases where the skill of a man is required, to determine whether he is dealing with a disease peculiar to animals or communicable to man, and whether or not it will necessitate the condemnation of the whole or part of the carcase. Sometimes it becomes more a question of what can be passed rather than what can be condemned.

I need not argue further the pathological side of my subject, because I feel sure it will be generally admitted that in pathological research lies the foundation of meat inspection. Although it sometimes may be said that the lessons taught by investigators cannot be applied absolutely in daily practice, nevertheless they provide a basis for further inquiry by those employed in public service. I not infrequently come across mysterious lesions of disease, which are invariably made clear by an interview with Professor Delépine, to whom I desire to express my debt of gratitude.

INSPECTION PRIOR TO SLAUGHTER.

An ante-mortem examination is a valuable safeguard against the sale of unwholesome meat, more particularly of animals that are known by the owner to be diseased, *e.g.*, animals taken suddenly ill at their homesteads. We know that there are diseases which, although very important as regards their effects on the fitness of the flesh for food, are not attended by any gross lesions in the carcase. It is also equally important that the slaughtering of animals should be conducted under the direct supervision of the inspector. In proof of this, we all know that the inspection of a dressed carcase after the butcher has finished his work, and more especially if the organs have been destroyed, is extremely deceptive.

MODES OF SLAUGHTER.

The meat inspector may be called upon to advise as to the best methods of slaughtering animals, as this has an effect upon the "setting" and keeping of the meat; and furthermore, we are morally bound not to inflict unnecessary pain.

Stunning followed by Bleeding.—This is the common method of slaughtering cattle in this country. The chief instrument used for the purpose of stunning is the pole-axe; after stunning, the animal is bled by making an incision at the lower end of the jugular furrow, so as to divide the large vessels at the entrance of the heart.

Pithing followed by Bleeding.—Not commonly practised in this country. The butcher stands in front or a little to one side of the animal, flexes its head, and thrusts his knife into the space between the occiput and atlas, dividing the cord at its junction with the medulla. The animal immediately drops and is then bled.

Bleeding without Stunning.—The common method for slaughtering sheep, and in some districts young calves and pigs. This is also the Jewish method of slaughtering all their animals.

Electricity.—A method that has been practised in America, but of which I have had no experience. One interesting feature in its adoption is that it will prove that animals killed by lightning need not be condemned on that account.

Shooting followed by Bleeding.—This is a method which is deserving of more attention. The hard skull of the bull and boar is with difficulty penetrated by the pole-axe, the thick skin over the frontal bone forming a natural buffer, and nothing is more pitiful than to see an animal struck repeatedly before it is rendered unconscious.

Greener's Humane Cattle Killer admirably meets this difficulty. The pistol is simplicity itself. It is charged with a bullet and placed on the middle of the forehead, and by a smart tap with a mallet it is discharged, and its effect is very satisfactory. For the slaughtering of horses I do not

think this instrument can be surpassed, and it certainly ought to take the place of the pole-axe at all knacker yards.

After an animal has been stunned, a couple of minutes should be allowed before sticking, to give the blood-vessels time to relax from the systemic shock, in order to favour bleeding. The blood should flow freely, become of a bright scarlet colour on exposure to the air, and should commence to coagulate in about two minutes after being withdrawn, and in about ten to fifteen minutes become a firm, elastic mass, capable of being sliced into sections which will retain their shape. About this time also serum will begin to transude out of the clot, which will decrease in size proportionately. Diseases such as anthrax, asphyxia, acute inflammatory affections, &c., alter the normal character of the blood, and interfere with its coagulability.

The amount of blood drawn at the time of sticking varies with the size, age, accuracy of sticking, position of body, &c.; roughly we may say that in the young animal of eighteen months old the quantity of blood will be about two and a half to three gallons, in the three-year-old bullock about four gallons, and in the aged milking cow sometimes four and a half to five gallons. Of course this does not represent the total amount of blood in the body.

INSPECTION AFTER SLAUGHTER.

If the inspection is made at the time of slaughter, the organs will be examined as they are removed by the butcher in his customary way of dressing, which is much the same in all animals.

To prevent repetition I may mention a simple rule to be observed in the examination of all organs. Their size, shape, colour, and consistency should always be criticised, also their outlines and relationships, after which one may search for pathological changes. A regular inspection is of extreme importance, as it will help one to trace the development and course of most diseases.

The Feet.—These require examining for injuries, septic changes, morbid growths, eruptions of foot-and-mouth disease, &c.

Intestines and Mesenteric Glands.—The bowels are used as a capsule for our black puddings and polonies. Their calibre and peritoneal covering and the thickness of their walls should be noted.

The mesenteric lymphatic glands in bovines are to be found running along the mesentery near its distal border, about four inches from the attachment to the small intestines. Their examination should never be overlooked in conducting a post-mortem examination for evidence of tuberculosis, and especially in proving the tuberculin test; intestines should always be condemned when their peritoneal covering or lymphatic glands are diseased.

The Stomach.—The first stomach is commonly called the belly, and after it has been scalded, scraped, and boiled. it constitutes tripe. The third stomach is not used, but the fourth is also converted into tripe. The average weight of the first stomach is from sixteen to twenty pounds. Some lymphatic glands will be found in the fat near the œsophageal entrance, and in the fissure on its anterior surface. The peritoneal surface of the stomachs is frequently affected with tuberculosis, and the mucous membrane of the fourth stomach with worm tubercles, a description of

which is given by Professor M'Fadyean in *The Journal of Comparative Pathology*, vol. ix. p. 314.

The Liver.—The normal weight of the ox liver is about ten to twelve pounds. It varies, however, very greatly, even in health. It is a common seat of disease, such as inflammatory changes resulting in fatty degeneration, cirrhosis, parasitic infection (fluke, hydatid cysts), abscesses, tumours (carcinoma, cavernous angeiomata, &c.), tuberculosis, and disseminated bacterial necrosis.

In the liver of the rabbit the parasitic infection known as coccidean disease is sometimes met with and mistaken for tubercle. The liver is studded with greyish-white nodules varying in size from a pea downwards, with purulent contents, which are found on microscopical examination to contain great numbers of the *Coccidium oviforme*. The individual coccidia are egg-shaped bodies, possessing a shell wall with protoplasmic contents. In some seasons an epidemic form of this disease occurs in rabbit-warrens.

Disseminated bacterial necrosis has also been mistaken for tubercle. The two diseases, however, are quite easily distinguished. Briefly, in this disease necrosed patches or areas are irregularly distributed through the liver substance, varying in size from a walnut downwards, with a well-defined outline which is not circular; in colour the patch of dead tissue varies from brown-yellowish to a dirty grey, and in consistency it resembles putty or unripe cheese, is not purulent, and it cannot be easily enucleated from the surrounding tissue. On the surface of the liver the nodules are slightly raised, yet somewhat flattened on their upper aspect, and firm to the touch. The lymphatic glands will be free from tubercular deposit. It may be also said that the liver is usually very much enlarged. The hepatic glands are to be found at the portal fissure.

(*To be continued.*)

ON DISINFECTION.

BY W. LESLIE MACKENZIE, M.A., M.D., D.P.H., LATE MEDICAL OFFICER OF HEALTH FOR THE BURGH OF LEITH.

(*a*) *Light and Air.*—In the Tenth Report of the State Board of Health of the State of Maine (1898) all the leading results of all the leading disinfectants have been admirably compiled by Dr. A. G. Young, Secretary of the Board. The authorities summarised leave no doubt that light, when allowed to act, is a powerful germicide. Sunlight is the most powerful; diffused daylight has a distinct effect; and electric light, though less powerful than sunlight, is still not without effect if continuously applied. "Anthrax spores were destroyed in a few hours by the action of sunlight."[1] But Momont[2] found non-sporing anthrax bacilli "in dried blood resisted the action of sunlight and air eight hours. . . . Anthrax spores resist the action of sun and air more than one hundred hours when dry." Geisler[3] records Janowski's observation that "typhoid bacilli exposed to direct sunshine were nearly all destroyed in from six to ten hours." In cholera the results vary. Palermo found that three or four hours' exposure to the sun

[1] Marshall Ward, *Centr. für Bak.*, xiii. 568, 1893.
[2] *Annales de l'Inst. Past.*, vi. 21, 1892.
[3] *Centr. für Bak.*, xi. 161, 1892.

"sufficed to deprive the germs of virulence when tested on guinea-pigs." [1] Tuberculosis exposed to air and light loses its virulence entirely in from a few minutes to several hours.[2] With other organisms somewhat similar results are recorded.

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(*c*) *Sulphurous Acid.*— This brings us to our chief point in dispute: Shall we continue sulphur or discard it? So ancient and well established a custom as fumigation by sulphur-burning is likely to find some justification at the hands of science. And it does. In Dr. Robert Angus Smith's book on "Disinfectants and Disinfection," sulphurous acid gets a high place. Its capacity to prevent or hinder putrefaction is maintained. But the book was written thirty years ago, when exact bacteriological tests were not possible. In N. de la Croix's table, reproduced in Dr. Lauder Brunton's "Materia Medica," [3] sulphurous acid, as a destroyer of developed bacteria, comes fifth in the list—that is, after chlorine, corrosive sublimate, chlorinated lime, and bromine. The strength indicated for germicidal purposes is 1 to 2009. But 1 to 190 is required "to prevent the reproduction of developed bacteria," as against 1 to 1250 for corrosive sublimate, 1 to 431 for chlorine, 1 to 336 for bromine. No details are given of the organisms employed, and, in the light of subsequent researches by other observers, these figures must be taken as the high-water mark of sulphurous acid in solution when applied to putrefactive bacteria. The results seem to be somewhat inconstant. As summarised by Dr. Rideal,[4] Vallin "found it perfect;" Arnold found 10 per cent. "an uncertain means of destroying spores;" Miquel "could not kill germs in twenty days;" Dujardin-Beaumetz "found that 20 grammes of sulphur, as used in the official French fumigation, did not kill *B. anthracis*, though it sterilised tubes of vaccine;" Koch found both sulphurous anhydride (the dry gas) and sulphurous acid (when sprayed) insufficient to kill spores. ("Sterilised tubes of vaccine," I understand to mean that the vaccine lost its capacity to produce a vaccination vesicle.) Other names are given. In the Maine Report already quoted, Dr. Young gives some more precise details of Koch's work. Koch found: "In a practically gas-tight casket 1 per cent. by volume of sulphur dioxide will kill dry anthrax bacilli in twenty minutes when on threads and exposed to the direct influence of the gas, and that under the same conditions the bacilli are destroyed in two minutes when the threads are damp. Anthrax spores, however, were wholly uninjured by a four days' exposure to 6 per cent. of the gas. When dried cultures of sporeless bacteria, not more than from one-tenth to one-half millimetre thick, were exposed in a room fifty hours to sulphur dioxide, none were killed. One hour after the sulphur was lighted the percentage of sulphur in the air was about 3; one hour later it was only 1·25; and twenty hours later 0·015." [5] Again: "In Sternberg's experiments sporeless bacteria were destroyed under favourable conditions;" but he admits that "the conditions of success are such that it appears almost impracticable to conform to them in practice on a large scale, and it is evident that much of the so-called 'disinfection' with this agent is a farce." [6] Thoinot, however,

[1] Maine Report, p. 291.
[2] Koch, Ransome, Delépine, *ibid.* p. 292.
[3] Third Edition, p. 91.
[4] "Disinfection and Disinfectants," First Edition, p. 95.
[5] Maine Report, p. 362.
[6] "Disinfection and Disinfectants," 1898, Concord, p. 64.

maintains that for tuberculosis, glanders, typhoid fever, cholera, diphtheria, "sulphur dioxide" has a disinfectant action.[1] He recommends 60 grammes for each cubic metre. But Wolffhügel found that twice this quantity cannot be trusted to destroy even sporeless infection in room-disinfection."[2] Dr. Novy (acting for the State Board of Health of Michigan) found, by strict experiment in an almost gas-tight room, that "sulphur fumes possessed little or no action on most bacteria when in the dried state. If, however, the specimens are actually wet, they will be destroyed, except in the state of the resistant forms, such as the spore state and tubercle bacilli. For tubercle bacilli or spore-containing material, wet or dry, it is of no value. It can be used for the disinfection of rooms which have been infected with ordinary disease organisms. From 3 to 6 pounds of sulphur must be burned in each 1000 cubic feet of space. The evaporation of water in the rooms where the articles are to be disinfected does not suffice. The walls, floors, and articles in the room should be sprayed with water. The room should be made perfectly tight, and should be kept closed at least twenty hours."[3] If these conditions are essential to success, clearly sulphur fumigation as ordinarily carried out in this country is of little or no disinfective value. These conditions of efficiency take no account of the incidental disadvantages of sulphur, *e.g.*, the bleaching of wall-papers and clothing.

The disagreeableness of the vapour is neither here nor there. That is probably an advantage, not a defect, and some maintain that the compelling power of a disagreeable smell is the main justification for continuing fumigation. I do not deny the compelling power, but I have not much belief either in the immunising effects of uninformed confidence or in the direct ventilation insured by sulphurous smells. No method can finally rest on such an argument. The somewhat misnamed "moral" effect of fumigation will not kill germs, and that is the beginning, middle, and end of the question.

Clearly there is a variable factor somewhere. Klein suggests that certain germs,—*e.g.*, *B. subtilis*, *Micrococcus ureæ*—thrive in an acid medium, and therefore sulphur may sometimes fail. It is certain that sulphurous acid is a powerful reducing agent, and therefore may act rather as a cleanser than as a disinfectant. But the results referred to are sufficient to make one hesitate before accepting it as reliable in the rough conditions of house disinfection. It is on all hands admitted that the dry gas—sulphurous anhydride—is itself of little value as a germicide, even in the most favourable concentration, but it has been maintained by Dr. Rideal that the moisture in the air of British climates is, as a rule, sufficient to convert the inefficient anhydride into the efficient acid. This is somewhat slender ground to form the basis of a universal practice. So far, however, in favour of sulphurous acid.

On the opposite side I give one or two facts. Professor Sheridan Delépine[4] found that when "large drops of typical tuberculous sputa were on pieces of paper and placed in various parts of the rooms to be disinfected . . . sulphurous acid was perfectly harmless so far as the bacillus was concerned. The tuberculous matter resisted the effects of exposure to sulphurous acid for a very considerable length of time, and showed no marked loss of vitality or virulence." Dry chlorine gas produced little

[1] Maine Report, p. 363. [2] *Ibid.* p. 364. [3] *Ibid.* p. 365.
[4] *Journ. of San. Instit.*, January 1898, p. 403.

effect, but 1 per cent. hyperchlorite of lime solution was found extremely potent. Even when anthrax spores were tried they were killed in a few minutes. It is a fair inference that both sulphurous acid and chlorine are most potent in solution. If these facts are so, it seems to me utterly futile either to rely on sulphur fumigation or even to use it as a preliminary when a house has to be disinfected for tuberculosis. Possibly the tubercle bacillus, as it resisted the ordinary methods of staining, is specially resistant to certain germicides, and therefore cannot be taken as typical either of staining or disinfection. Before, however, I come to the practical deduction I wish to make, I should like to give an instance to cover other than tubercle and anthrax, which, after all, are comparatively uncommon germs in routine disinfective work. In the Maine Report [1] are recorded some experiments with sulphur fumigation. The experimenters—Professors F. C. Robinson and B. L. Bryant—were testing the value of formaldehyde, and as "a comparative experiment in room disinfection, 12 pounds of roll sulphur were obtained for one of the same rooms used in the aldehyde experiments. This has a capacity of rather more than 2000 cubic feet. The sulphur was placed in an iron kettle, and this in a copper tank filled with water so that the water came up around the kettle above the top of the sulphur. The sulphur was wet with alcohol and set on fire, and the room closed as tightly as possible. Diphtheria and anthrax cultures, soaked into bits of blanket, were placed about the room, some free and others in packets. Twelve hours afterwards the sulphur was found still burning, and so the room was left closed for twenty-two hours. In the morning it was impossible to enter the room to collect the cultures until after the windows had been opened for some time. All the windows were covered with a heavy dew of sulphurous acid, and the Pétri dishes and cultures in the same way. Two or three litres of water had been evaporated, and all the sulphur burned. Every one of the cultures grew luxuriantly after a day's incubation. This result was so decidedly positive that it was thought unnecessary to make further experiments with sulphur. It showed how utterly worthless this agent is by the side of formaldehyde disinfection, even when properly used in these large amounts." The contra-experiments with formaldehyde were not always absolutely successful, but the results were, beyond all comparison, better than anything I have referred to regarding sulphur.

To bring this collation of discrepancies to a point—First, to be of any real disinfective value, sulphur must be burnt in the presence of water or water-vapour; second, the efficient agent is the sulphurous acid so formed; and third, the deposit of this liquid acid on the infected surfaces is the essential part of the whole process. These appear to me fair inferences from the facts I have described. But if the deposit of the liquid acid is the essential part, why not apply it directly to walls and other infected localities by a spray or jet? Surely burning sulphur for hours is a very roundabout way of applying a liquid disinfectant to a wall. It is a vastly more simple matter to begin with the liquid and spray it directly on to the wall. Fumigation takes hours; spraying, to produce a much more definite and controllable result as to deposit of liquid, is a matter of minutes. That, however, raises the question—Is it worth while to spray on a liquid that stands the bacteriological tests so inconstantly? For my own part, I do not think it is, and the choking effect of the liquid acid would be even

[1] Page 167.

more disagreeable than formalin or hypochlorite of lime, both of which are demonstrably more reliable.

On the whole, therefore, after a fair estimate of disinfective value and practicability, I conclude that the time has now come for the discarding of sulphur fumigation. Personally, I discarded it for house disinfection three years ago—that is, as soon as I was placed in executive control of such disinfection. For hospital disinfection, I discarded it four years ago. I have not discovered any new facts that would lead me to revert to sulphur fumigation either for houses or for hospitals.

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(*d*) *Corrosive Sublimate.*—This is the disinfectant used by the Municipal Disinfection Service of Paris for the sprayers. So far as I can gather, no toxic results have been reported; but when I adopted the spray for house-disinfection, I hesitated to run any risk. My hesitation has been justified by at least one episode. Recently for the disinfection of some small-pox wards, I gave the disinfectors some powders of corrosive sublimate; each powder contained 70 grains of the sublimate and 15 grains of ammonium chloride; one powder making, with 1 gallon of water, a solution of 1 in 1000 (corrosive sublimate). The men found the spray extremely irritating; it induced vomiting in both; it affected the bronchi in one, who continued to cough for a night, and was occasionally affected to vomiting. The symptoms passed off completely in less than twenty-four hours. There was no sign of salivation afterwards. Possibly the presence of ammonium chloride may have had something to do with the toxic symptoms; but one experiment of the kind was enough. The men both preferred the formalin solution to the corrosive. I have seen similar symptoms when the same wards were *washed* with 1 in 1000 solution of corrosive sublimate. Apparently the amount absorbed by inhalation was enough to induce squeamishness, and in one or two cases persistent vomiting. These facts would not be enough to justify the non-use of corrosive sublimate for spraying; but they certainly ought to induce great care in its use, and since other less noxious disinfectants are available, I do not feel urged to the use of corrosive sublimate, even with its admittedly high disinfective potential.

(*e*) *Choride of Lime and Hypochlorites.*—In the literature of the lime chlorides and hypochlorites there seems to be some discrepancy of statement. Probably this is due to the confusion of commercial names. About the disinfective efficiency of hypochlorites of lime and soda there is no discrepancy. The active ingredient is chlorine; the efficacy of the disinfectant is in direct proportion to the amount of available chlorine, and the only point for practice is—which is the least objectionable form of applying the gas to the walls, or securing its generation there? Two illustrations are enough to demonstrate efficiency: (*a*) Dr. Sheridan Delépine found that "if a weak solution, made with about one part of the original chloride of lime and 100 parts of water, was applied to the walls or to any paper impregnated with tuberculous matter, thorough disinfection was obtained in a few hours. Disinfection was invariably obtained in that way, and, in fact, an exposure of a few minutes was generally sufficient, even with a weak solution like the one he had mentioned, when the layer of virulent sputum was not very thick."[1] Again, on experimenting with "hypochlorite of lime on various other germs than the tubercle bacillus," Professor Delé-

[1] *Journ. of San. Instit.*, vol. xviii. p. 403.

pine "found that every germ tried was rapidly destroyed when brought nto contact with a 10 per cent. or even 1 per cent. solution of chloride of lime. . . . Anthrax spores placed for a few minutes in such a weak solution as that he had just mentioned were killed."[1] (In these quotations the terms "chloride of lime" and "bleaching powder" are, I presume, synonymous, and both are synonymous, with "chlorinated lime." All three are names for a mixture containing chloride of calcium and hypochlorite of calcium in varying proportions. It is a pity that one precise term cannot be agreed upon.) The results recorded in Dr. S. Ridael's book, and in the Maine Report, are somewhat inconstant. The inconstancy is mainly due to the inconstancy in the composition of the liquor resulting from the dissolving of chloride of lime. The liquor seems to contain chlorine in a quantity varying with the previous exposure of the chlorinated lime. If this be exposed to light or to moisture the amount of available chlorine is reduced. Consequently, to be quite reliable, the chlorinated lime must be fresh, if not freshly made.

This difficulty could be easily overcome. But there are other objections to the chlorinated lime liquor—it bleaches and tarnishes. Even these are not insuperable objections; in many varieties of house and ship they are not objections at all, but they certainly take away from the general simplicity and convenience of the disinfectant. I am thinking chiefly of walls and furniture. Where clothing, sponges, and the like are in question, one objection is serious: hypochlorite or chloride of lime renders, or tends to render, these articles brittle and ready to disintegrate. The same happens with hypochlorite of soda. No doubt this disastrous effect can be avoided when the disinfective solution is very dilute, or the time of exposure is short. But, in routine disinfection, these are very serious difficulties; for usually the articles to be disinfected are not very clean, and therefore the solutions should be stronger rather than weaker; and usually the removal from the steeping tub must be left to the discretion of the lieges, and, therefore, overtime is certain to be rather the rule than the exception. On one occasion, I left two good sponges for an hour in a recommended solution of hypochlorite of soda (perhaps, as it ought to be, the solution was stronger than normal). They were beautifully bleached; they smelt wholesomely of chlorine. But when I began to use them, they came to little pieces in my hand. I have not experimented with linen, cotton, or woollen articles; but from the experience of others I gather that the same disintegration is liable to occur. In the disinfection of walls this is less an objection. Professor Delépine applied his liquids by a brush. He says that the damage to papers, &c., was less than one might expect. Possibly, but other things sufficiently nearly equal, that disinfectant is best that does no damage at all. He suggests that the damage was due to the mechanical action. In that case the spray would be at once a partial preventive of damage and an adequate dispenser of the liquid. In brushing, as in spraying, the object is to get the liquid on to the organism. The mechanical action of brushing is more gross and less regular than the wind action of the sprayer, and, therefore, the spray method is preferable. The only point open to argument is—Is the mechanical effect of the spray sufficient to drive the liquid on to the organism? To this the reply is, that what blows cobwebs away is enough to blow liquid on to the cobweb dust. The spray thoroughly wets, under

[1] *Journ. of San. Instit.*, vol. xviii. p. 404.

considerable local pressure, the surfaces exposed to it. What the hair-brush does the spray-brush—for it *is* a brush of fine threads of air and liquid—will also do. (*b*) An illustration from the Maine Report: —"The careful work of Nissen [1] tended to confirm the value which Dr. Sternberg and the Committee of the American Public Health Association had ascribed to chloride of lime. Nissen's experiments were made with pure cultures of the bacillus of typhoid [*sic*], of cholera, of anthrax, and *Staphylococcus pyogenes aureus* and *Streptococcus erysipelatis.* The micro-organisms were in bouillon with 1 per cent. of peptone and 0·5 per cent. of common salt. Typhoid bacilli were destroyed with certainty in five minutes when the bouillon contained not less than 0·12 per cent. of chloride of lime, whether the mixture was filtered or not. Cholera bacilli were always killed in five minutes, and in most cases in one minute. . . Anthrax bacilli, without spores, were destroyed in one minute with a 0·1 per cent. solution, and streptococcus just as quickly when the bouillon contained 0·2 per cent. of chloride of lime. Solutions of chloride of lime were found to lose their disinfectant power rapidly when used on anthrax spores. This was observed even in ten, fifteen, and thirty minutes after they were prepared. . . Nissen says that chloride of lime may be added in the form of powder to dejection at the rate of 0·5 per cent. of the volume of the matter to be disinfected; or, taking into consideration the difference in the quality of the chloride of lime, 1 per cent. may be added (1 gramme to 100 c.c.). The stool may be emptied in ten minutes after the addition of the chloride of lime."[2] (In the Maine Report chloride of lime is synonymous with hypochlorite of calcium).

(*f*) *Lysol.*—This I take as the type of a viscid, but soluble, disinfectant. It is held to be superior to carbolic acid in disinfective power. For washing of woodwork, floors, beds, &c., it is eminently suitable, being at once a soap and a disinfectant. For such purposes it should be used in hot solutions of 1 to 2 per cent. For the purposes of spraying or showering it is more suitable than the emulsions, but less suitable than the clear liquids. With its other numerous uses we are not here concerned.

(*g*) *Carbolic Acid and Common Salt.*—A disinfectant so well accredited by so many various masters as carbolic acid hardly requires mention. But carbolic acid will not do everything, and to do anything it must be intelligently handled. With the anthrax spore test it fails like most others; but the range of its efficiency is wide enough for most practical purposes. For disinfecting walls by washing or rubbing, it may be sufficient; but in the practicable solutions it is certainly less reliable than the hypochlorites, or corrosive sublimate, or formaldehyde. "In a paper on the molecular conditions of aqueous solutions of disinfectants, as regards their efficiency, Dr. Scheurlen states that 1 per cent. solutions of carbolic acid, or of the cresols, in water failed to destroy *Staphylococcus pyogenes aureus* in five minutes; but 1 per cent. solutions of carbolic acid, with 24 per cent. of common salt, or 1 per cent. cresol, with 12 or 13 per cent. of common salt, destroyed the same organisms in one minute. He found also that 1 per cent. carbolic acid with 12 and with 20 per cent. of common salt, and ½ per cent. as well as 1 per cent. of cresol, with 13 and again with 19 per cent. of common salt, destroyed anthrax spores in three days at latest, while these solutions without the addition of the salt had hardly the slightest effect

[1] *Zeit. für Hygiene*, viii. 62, 1890.
[2] Maine Report, pp. 199, 200.

upon the spores."[1] These are striking facts. Surgical habits have, I suspect, had a good deal to do with the uncritical belief in the high disinfective potential of carbolic acid.

(*h*) *Formaldehyde.*—The disinfective efficiency of formaldehyde it is convenient to discuss under two heads:—1. Efficiency as a free gas. 2. Efficiency as a solution in water (formalin) or alcohol (holzin). The disinfective agent is always the gas, but for some reason or other the results of the free gas do not quite conform with the results of the gas in solution. The same was true of sulphurous anhydride and sulphurous acid. The precise physical and chemical reasons for this I need not speculate upon; what concerns us now is the fact of the discrepancy. A few selected facts will determine whether, for our primary purpose of room disinfection, either the free gas or the dissolved can be relied upon.

1. *As a Free Gas.*—The gas has been put to very severe tests, and has come out on the whole well. Authorities are not unanimous, but very nearly so. The objective results recorded are certainly very strongly in its favour. Professor Sheridan Delépine names the following organisms as the "most convenient for testing gaseous disinfectants": *Bacillus coli communis*, *Bacillus pyocyaneus*, *Staphylococcus pyogenes aureus*, *Bacillus subtilis* (sporing), *Bacillus anthracis* (sporing), *Bacillus tuberculosis* in sputum, fresh or dry, horse-manure with highly-resistant sporing bacilli. These are to be taken in young or old cultures, in emulsions, on threads, on agar, &c. He adds: "I think a disinfectant capable of killing the six first organisms exposed to it in various states and under various conditions is, for practical purposes, a reliable disinfectant. If, in addition, it is capable of destroying the spores usually found in horse-manure, and which often can resist for half an hour the action of saturated steam at 100° C., the disinfectant may be considered as exceedingly powerful."[2] How does formaldehyde stand these tests? Thus: (1) With unimportant exceptions the *Bacillus coli communis*, *Bacillus pyocyaneus*, *Bacillus tuberculosis*, and *Staphylococcus pyogenes aureus* were killed whether in the dry or moist state, even when placed in deep narrow recesses (2 inches from the opening of tubes open only at one end, or protected by one to three layers of filter-paper, or embedded in a thick layer of sputum). (2) The spores of the *Bacillus anthracis* were killed in twelve experiments out of nineteen, made under conditions not favourable to the free access of the gas. The differences in the results seem to have been due more to certain states of the spores than to variability in the action of formic aldehyde. (3) The action on spores of the *Bacillus subtilis* was uncertain. The very highly-resisting spores of a horse-manure bacillus resembling the hay bacillus could not be killed by exposures of a practical duration. The only evidence of action was a distinct delay in their growth."[3] He adds, further, that "wood spirit of the proper quality and strength costs 10s. a gallon. . . . It is quite evident that formaldehyde is the best gaseous disinfectant we possess at the present time for objects which are liable to be damaged by damp, chlorine, dry and moist heat." Now as to quantities and time of exposure. One or two instances are enough. In three experiments with silk threads impregnated with thick emulsion of

[1] Maine Report, pp. 191, 192; *Archiv. für Exper. Pathol. u. Phar.*, xxxvii. 74, 1896.
[2] Some Experiments on the Disinfection of Rooms by Gaseous Formaldehyde, *Journal of State Medicine*, 1898.
[3] *Journal of State Medicine*, 1898, p. 15.

anthrax spores and kept dry in the dark for eighteen months, the duration of exposure was twenty-four hours; the amount of alcohol consumed was 59,000 m.; the distances of the objects from the lamp were respectively 9 feet, 6 feet, 10½ feet; the cultivating test media were respectively bouillon, agar, bouillon. The result was complete sterilisation in each case. The control experiment gave abundant growth. In five experiments with partially-dried tuberculosis sputum, the duration of experiment was twenty-four hours. The amount of alcohol consumed was 2950 m.; the distances were as in the anthrax experiments. In every case the result was complete sterilisation. For practice, the only point to decide is this: Can Professor Delépine's conditions be reproduced? This I shall discuss further on.

These striking experiments are in many ways confirmed by the work of Messrs. F. C. Robinson and B. L. Bryant in their "Bacteriological Report upon Formaldehyde."[1] But their results are best discussed under methods of application. All the leading facts have been summarised by Dr. A. G. Young.[2] With two or three exeeptions the authorities speak in the same sense as Professor Delépine.

(*To be continued.*)

Clinical Papers.

A CASE OF GASTRIC ULCER.

BY JOHN FREEMAN, F.R.C.V.S.

A Scotch deerhound of enormous size, the property of Stewart Kennedy, Esquire, was sent to me at the request of Mr. Finlay Kerr for treatment. From his appearance he would lead one to suppose he had worms, for which he was treated, but with no result. He was then put under tonic treatment, but no improvement took place, although the dog fed well and was lively, but gradually kept wasting away and losing more or less power of the hind limbs.

Diagnosis.—Pernicious anæmia. For change he was sent to Mr. Ruby's Convalescent Home in Blackrock, and for days seemed to improve, feed well, and he took his exercise well. On the fourth day I received a telegram:—"Come at once, dog very swelled"; and almost immediately a second telegram, saying:—"Dog dead; send for carcase."

The carcase arrived at O'Keefe's (the knacker's), and was enormously swollen (emphysematous). On opening into the abdominal cavity I noticed that the contents of either bowel or stomach were floating about, and on further examination I found a perforating gastric ulcer the size of half-a-crown; the edges of the ulcer were as clean as if punched out, and no inflammation was evident. The rest of the stomach was quite healthy; likewise all the internal organs.

The peculiarity of this case was the total absence of any gastric symptoms.

[1] Maine Report, 1896-97, pp. 132-169. [2] *Ibid.*, pp. 234-265.

FRACTURE OF THE INFERIOR MAXILLA IN THE HORSE BY A SEVERE BIT.

BY F. C. MASON, M.R.C.V.S., ROYAL VETERINARY COLLEGE OF IRELAND.

THE only excuse offered for bringing forward what may appear to many present a trivial and common case, is the fact that in this and in two other cases with points of similarity, the writer happened to act in conjunction with the respected Hon. Secretary of this Association, and he feels that it may be of interest to many present to hear how completely and quickly recovery may be expected under favourable conditions in cases where portions of a fractured bone have to be removed.

The *subject* was an American trotter to which the writer was called on account of loss of appetite, the request being worded "to come and rasp his teeth." On approaching the mouth of the animal (which was in wretched condition) the latter showed great reluctance to allow his mouth to be touched. Having, with a little difficulty, obtained possession of the tongue, the latter organ was found to be lacerated in longitudinal lines. Further examination showed the presence of a spicule of bone projecting through the mucous membrane of the right ramus of the inferior maxilla.

Gentle attempts at removal proving abortive, the veterinary attendant found it necessary to enlarge the orifice through which part of the bone protruded, after which the bone now before the meeting was extracted with a pair of tooth forceps.

It is supposed that the injury to the jaw was caused by the use of a very severe bit on a bad "puller," and that the laceration of the tongue was caused by the spicule of bone protruding through the mucous membrane.

After-treatment consisted of a free use of boracic acid at the time immediately subsequent to the operation, a liquid diet only being used for two days. Within five days the wound had so far healed that the owner was able to drive the patient six miles to Mr. M'Kenny's yard for the purpose of examination, and the wound has never since given any trouble.

In connection with this subject it may be mentioned that the writer, with Mr. M'Kenny, treated a celebrated trotting pony—"Mouse"—suffering from a fracture of the os pedis, and after one piece of bone had been removed by Mr. M'Kenny and another by the writer at an interval of some days, there was complete recovery, and the animal is at present working sound.

Here also the chief dressing used was boric acid.

FRACTURE OF THE OS PEDIS.

BY A. J. BECKETT, M.R.C.V.S., ROYAL VETERINARY COLLEGE OF IRELAND.

THE lesion I am bringing before your notice is interesting in some respects. Complicated as it was by sandcrack, and by entire absence of crepitation, it was not diagnosed during life. The post-mortem examination proved in this case, as it does occasionally, a rather unpleasant surprise, and shows the real value of post-mortem examinations as a test of the correctness or otherwise of clinical diagnosis.

The animal, an aged dray mare, had been affected with a chronic sandcrack in the near hind foot for some considerable time. This, although well marked, had not affected the coronary or laminal structures,

and did not cause lameness. This animal had a nasty habit of kicking out viciously after being turned or backed, and frequently struck the wheel tyre, the concussion producing temporary lameness. One day she was driven into my yard dead lame, in fact holding the foot up when stationary. The history obtained was that when turning she had lashed out and hit the tyres as usual, after which she showed the symptoms observed. On examination I found the sandcrack much enlarged and bleeding, and extending upwards to the skin over the coronary band. Although this injury appeared quite sufficient to cause the lameness and pain exhibited, I examined for fracture as thoroughly as was possible under the circumstances, but could not detect crepitation. I therefore concluded that the lesion was mainly superficial, and that the pain evinced was due to the sandcrack and inflammation of the laminal structures following the injury. The animal was taken home, a poultice applied, and she was allowed to lie down. On visiting next day I found lameness more marked, the patient sweating; there was fever, a hard wiry pulse, and evidence of great pain. I had the shoe removed and the hoof grooved to relieve pressure. Sedative treatment was adopted locally and generally. The case, however, proved most refractory; pain was constant, marasmus marked, in spite of the fact that the mare was feeding regularly and lying most of the time. In a few days bedsores on knees, hocks, haunches, &c. became very conspicuous, due to the constant struggles of the animal in moving. Slings were out of the question owing to the construction of the stable, and I doubt if they would have been of any benefit in this case, as the animal lay constantly. After a week, in spite of the best antiseptic treatment possible under the circumstances, pus appeared above the site of the sandcrack, and gradually spread round the coronary band. I advised slaughter, but the owner would not consent, and kept the animal until she died a day or so later from exhaustion.

The post-mortem examination showed a fracture of the os pedis, the piece being detached and free in the horny covering. This lesion, I believe, accounted for the unsatisfactory course the case had taken.

In Möller's surgery it is stated that fractures of the pedis are rare and said to be caused by slips, picked-up nails, the heel of shoe being caught in rails, by falls, and by striking walls when jumping. I have not seen mentioned a case in which the lesion was complicated with sandcrack, and hope it may prove of interest to the members.

Möller believes that recovery from fractured os pedis chiefly depends on whether the other foot endures the extra strain without becoming affected with laminitis, and that the prognosis is therefore ruled by the degree of pain. He prefers to allow the animal to lie if it will do so, rather than use slings for support.

FRACTURE OF THE EXTERNAL ANGLE OF ILIUM, WITH AN UNFORESEEN SEQUEL.

BY H. G. ALLEN, M.R.C.V.S., DUBLIN.

Subject.—A black mare, ten years old.

History.—Had slipped up in her stall, and when brought out for work was found to be going "stiff" behind.

Symptoms.—Mare very lame on the off hind limb, walking lame; when trotted went all to the near side, not moving in a straight line; marked abduction of the affected leg, with evident difficulty in advancing the limb.

On manipulation of the off hind quarter the muscles gave signs of having been strained.

Careful examination of the angle of haunch revealed neither crepitation, pain, swelling, or abrasion present.

Diagnosis.—Hip lameness, the superficial muscles being evidently stretched and strained, in consequence of slipping in the stall.

Treatment.—Rest, hind shoes removed, roomy box. Hot fomentations, and infriction of a stimulating liniment (ol. terebinth., liq. amm. fort., and ol. lini.) daily to gluteal region ; this treatment was continued for a fortnight without any beneficial result. The man in attendance reported on the seventeenth day that there was a swelling on the quarter of the off side. When I examined the swelling in question I found it to be extremely tense on palpation, leading me to suspect a "hernia."

Observing the external angle of the ilium, I noticed to my surprise that the under portion of the posterior part was deficient. I then came to the decision that what I had to deal with was a gravitation abscess, reasoning it out that the portion of bone detached was pulled down by the internal abdominal oblique muscle towards the direction of the umbilical region, and was undergoing "necrosis." I accordingly lanced the abscess at a dependent part to allow of drainage, and gave exit to over a quart of offensive purulent material, some of which was of a curdy character, the remainder liquid. The abscess cavity was irrigated twice daily with Jeyes' solution—(1-40)—and plugged afterwards.

Pieces of degenerated muscular tissue came away daily, of a yellowish grey colour, on flushing out of the cavity. This treatment was continued for over a week without there being any diminished amount in the discharge.

I was called to see the horse at the beginning of the fourth week, as she was constantly lying down, and when in the recumbent position showed great difficulty in gaining her legs again, having to receive help. I knew then that her back must be injured, suspecting ankylosis. On inquiry I found out that she always showed symptoms of inability to rise when once down prior to her entrance on the sick list, so that there was no connection between it and the affection she was already suffering from ; after this I adopted slings. When I had my patient lying down I secured her, and explored the position where I had lanced. After enlarging the incision I found that my previous surmise was correct, there being a piece of bone—made evident by digital percussion—directly in contact with the abdominal cavity, in the region of the flank, a few inches above the loose piece of skin ("Flesk") in front of the stifle. I therefore decided to operate, owing to the liability of the necrosed piece of bone eventually finding entrance to the abdomen, peritonitis resulting.

Having obtained permission to operate, pointing out at the same time that there was a risk on my part in penetrating the abdominal cavity, the horse, being duly prepared for chloroform, was cast, and the chloroform administered (℥ii). Area of operation was clipped as close as possible, washed with soap and water, and afterwards rendered aseptic by Jeyes' solution (1-40). I then further increased the incision already made, reaching in length seven inches. On examining the piece of embedded bone I found that it was out of the question to remove it *en masse*, as the abdomen would for certain be penetrated. Trephining the central part of the bone, I thought I could by that means loosen it, but was not successful, and had to finally suture up the wound and let the mare up. The muscles surrounding the piece of bone were of a green hue. On the fifth day after my

previous operation I threw the mare down again, and chloroformed as before (ʒii); this time I was well armed, having procured a small surgical saw, and some strong scalpels and forceps. I now set to work—after removing the former sutures and rendering the wound thoroughly aseptic—to dislodge the embedded bone piece-meal, sawing small pieces until they were considerably loosened, and then removing them with scalpel and forceps. This lasted for three and a half hours, in which time I had removed between fibrous tissue and bone an ounce and a half per weight. After thorough irrigation of the wound I put in six cane tape sutures. I may mention that there were four oblique-mouthed channels in a vertical direction in the vicinity of the necrosed bone, having to be thoroughly syringed out to remove the pent-up pus in them on dressing the wound; afterwards they ultimately closed up. The dressings used from this date—second operation—were first Jeyes' solution (1-40), and then carbolic acid solution (1-40), the wound being dressed twice daily. When the wound was well on its way to healing tr. iodine solution (1-10)—with pot. iodid. added to keep it in solution—was used in lieu of the carbolic dressing. The sutures were removed in about a week's time—the "gaping wound" thus caused was kept plugged with Hartiman's corrosive sublimate wool, and antiseptically treated, as previously. There was a great hollow in the flank and quarter of the off side after the wound was healed, the mare, however, going sound. Mare was discharged as cured at the end of July, being admitted to sick list the 2d April. I ultimately had the mare destroyed on the 9th of October, owing to the ankylosed vertebræ.

Autopsy revealed the under portion of the posterior part of the external angle of ilium deficient. Ankylosis (ossific) of bodies and transverse processes of the lumbar vertebræ. The seat of operation perfectly healthy, the skin being only thickened where the operative incision has been made.

FRACTURED OS PEDIS.

Subject, brown gelding hunter, six years old.

History.—After jumping out into a road dropped dead lame, so much so that the owner thought the horse "had put out his shoulder," and had eventually to be brought home in a cattle float.

Symptoms were those typical of shoulder lameness, viz., disinclination to bring the fore-leg forward, dragging of the toe. There was, however, a marked inability to bear weight on the affected limb; no pain was evinced on percussion of the wall or sole of the foot, or on manipulation of the muscles in the vicinity of the shoulder.

Treatment.—Cold-water swabs continually kept to the foot. Coronet was blistered in four weeks' time. The horse gradually got better, and did farm work after six months. Horse was eventually destroyed, owing to having received a compound comminuted fracture of the tibia, as the result of a kick.

Autopsy showed the fracture in a united condition. The following points are descriptive of the fracture. Callus on the upper portion of the internal lateral part of the laminal surface, and in immediate contact with pyramidal process. Comminuted fracture (three pieces) of the left lateral portion of the articular surface of the os corona. Displacement of the left articular surface of the navicular bone in a backward direction. Fracture extending across tendinous surface (anterior part) of bone, inclined more

to the left than right, through semilunar crest into solar surface towards the left central division. Notch at toe of bone, due to absorption, in consequence of tight toe-clipping.

Sidebones.—The presence of these, I think, had a great deal to do with the uniting of the fracture.

At the present time I have a chestnut charger gelding, aged, almost sound, having been the subject of a "fractured os pedis," which was caused by being turned on a very irregular and stony field during the period of convalescence from pneumonia, and was brought in one night terribly lame.

In this case there was dragging of the toe, disinclination to bring the leg forward, inability to bear weight, but pain on percussion of the sole or wall by the hammer, the patient uttering a groan of agony.

I had this horse under treatment for two months, and he is turned out out at present; the last thing I heard about him was that he was going splendidly.

In these cases I adopted peat moss as a bedding, for the reason that it is constant, and not liable to get so displaced as straw, leaving the floor bare.

The above cases were submitted and specimens exhibited at the Veterinary Medical Association of Ireland at a meeting held on the 30th November in Dublin.

CONGENITAL CYST.

BY T. CHAS. HOWATSON, M.R.C.V.S., ST. ASAPH.

DURING the last week in August 1899 I was asked to go and see a horse that had a big swelling under the jaw.

Subject.—Iron grey gelding, 14½ hands high, three years and six months old, in good condition, and never been handled.

History.—Born and bred on the farm by the owner, who had noticed a slight lump under the jaw when the animal was born, but thought nothing of it till the time he came to me, when he thought the lump was increasing in size.

After some difficulty the cob was haltered, and I proceeded to examine the swelling, which was about half the size of a football, and, completely filling up the space between the rami of the inferior maxilla, bulged over the edges of the rami. I now examined the inside of the mouth, everything was quite normal, so again turned my attention to the swelling. The skin over it was quite tense, the swelling was somewhat hard, but at two points I could feel something harder than the surrounding structures; thinking there might be malformation of the hyoid bones I moved the tongue about, but could not detect any movement of the hard points.

Diagnosis.—Taking into consideration the fact that the swelling had existed from birth, that the interior of the mouth was healthy, that mastication, deglutition, and respiration were performed normally, and that the animal suffered no inconvenience whatever, I concluded it was a congenital cyst, and advised its removal.

The owner said he would think the matter over and let me know.

I heard nothing more till March 13th of last year, when a horse-trainer brought the cob to my yard, and said he had brought him to be operated on as he made a noise when his head was held tight.

My patient was put on bran diet, and the following day given five drms. aloes. Bran mashes continued, and on the 17th he was cast and chloroformed. The head was drawn well back and the seat of operation closely clipped and washed with soap and water, then I applied a solution of hydrarg. perchlor. 1–1000. I then inserted a small trochar and cannula into the lower part of the swelling. On removal of the trochar a quantity of straw-coloured fluid escaped, and the swelling rapidly diminished in size. A longitudinal incision was made from the symphysis of the rami to the larynx, first through the skin and then through the walls of the cyst, which had to be entirely dissected out. The attachments were very firm, especially to the spur process of the hyoid bone and the inferior surface of the larynx.

The cyst removed, the cavity was washed with sol. hydrarg. perchlor. 1–500, the edges of the wound were drawn together with continuous silk suture, a small opening being left at the bottom. A huge pad of cotton wool was applied and kept in place by a bandage round the head. I found it difficult to apply a bandage securely because of the movement of the jaws, so got a saddler to cut me a piece of soft leather, somewhat larger than would cover the maxillary space: this was kept in position by straps over the head and forehead and broad elastic bands over the nose.

For twelve hours after the operation I noticed continual gulping; possibly this was due to irritation of the salivary glands. This had, however, passed off by the following morning, when he took a bran mash. The wound was dressed twice daily with iodoform, and the suture removed on the third day after operating. A pad of cotton wool was kept on the part for fourteen days. He was gradually put on ordinary diet of hay, crushed oats, and bran, and left my yard on April 7th with nothing more or less to be seen than a thin scar where the incision had been made.

On examining the cyst after its removal I found the five hard points referred to, to be pieces of cartilage about the size of a two shilling piece, with convex sides; these, on section, proved to be hollow, and divided into two compartments by a thin membrane running crossways. From the upper part of the primary cyst there was a fleshy protuberance, about an inch long and about the thickness of a finger, with a small depression on the fore end; round this was a quantity of long hair, similar to that of the mane, matted together with caseous-looking matter. Otherwise, the internal lining was perfectly smooth.

I saw the cob a few days ago, and found it almost impossible to detect where the incision was made. I also tried his wind but could not detect any sound.

Extracts.

ULCERATIONS OF THE PITUITARY MEMBRANE, SIMULATING GLANDERS.

M. NOCARD, in exhibiting to the *Société Centrale de Méd. Vét.* some specimens, said that they had been taken from a mare, a splendid, large animal, which had been sent to him three years ago. For some months past she had been presenting a bilateral discharge, not very abundant, sometimes streaked with blood, as well as ulcerous lesions of the pituitary membrane and of the turbinated laminæ, on account of which she was isolated as

being suspected of glanders. There was no glanders, properly so called, but merely a little hypertrophy of the lymphatics. Two injections of mallein had been made, with a month's interval, whilst the mare was still in the possession of her owner, but no reaction was obtained. Still the lesions of the nasal membrane appeared so characteristic that her case was pointed out as a clear illustration of the possible failure of mallein to detect disease. Before seeing the animal, M. Nocard said to the owner that in the absence of all reaction after two successive tests with mallein, the animal could not be glandered. As the owner was afraid to keep the mare, she was sent to Alfort for purposes of experiment. On arrival at the College she was found to be fat and well fed, and seemed to be in the best of health. A slight discharge of a yellowish colour was escaping from both nostrils and forming tiny scales, soft and sticky, adhering to the fine hairs of the tegument of the nostril. There was no glanderous swelling in the region of the alveus, but only a few slightly hypertrophied ganglia, painless to the touch, and moving about under pressure of the finger. On both right and left sides the nasal membrane in the part that could be seen and felt was thickened, and, so to speak, puffed out and covered with soft yellowish or reddish incrustations of slight adherence ; these being removed, there was left exposed an irregular granulated surface, red and bleeding. Identical lesions existed at the extremity of the turbinated laminæ. Their appearance was quite different from that of the lesions which characterise chronic glanders ; in place of there being pits in the thickness of the membrane with projecting borders indurated, and, as it were, cut straight down, it was a case rather of turgidity of certain regions of the mucosa, the projecting part of which, deprived of its epithelium, looked as if it were ulcerated. Acute glanders sometimes produces similar lesions, but this appearance is quite transitory, and it is accompanied by a grave general condition which was quite wanting in the present case ; its evolution especially is extremely rapid—it was clearly absent in this animal.

Another injection of mallein was tried, but again without result. Two male guinea-pigs inoculated with the discharge, the one under the skin, the other in the peritoneum, showed none of the ordinary symptoms of glanders. Two others endured, also without mishap, intra-peritoneal inoculation with the product of the scraping of the pituitary lesions. This could not be a case of glanders, nor could it be one of tuberculous lesion ; the negative result of the inoculations in the guinea-pig and of the injection of tuberculin made at intervals proved that abundantly.

All this took place in 1897. From that time onwards the animal had been used for various experiments ; she remained in an open stable in the midst of a dozen other horses without any of them presenting the slightest symptom that could cause uneasiness. During the three years that followed it was impossible to note any change in her condition ; she seemed to enjoy perfect health ; the nasal lesions remained exactly as they were in 1897. She was slaughtered in November 1900, and M. Nocard made a minute and careful post-mortem examination. Contrary to expectation, the nasal cavities presented no other lesions than those observed during life. The nasal septum was quite free from injury in all the upper section ; in its lower fourth, both to the left and to the right, the mucosa appeared hypertrophied, irregularly thickened, turgid, and ulcerated at the more salient points. The mucosa of the sinus was quite healthy, but the same cannot be said of the mucosa of the larynx and of the trachea. The posterior surface of the epiglottis showed two small ovoid ulcerations clearly defined,

with projecting indurated borders, and greatly resembling the chancres of chronic glanders; at its base and on the right side the fold of the mucosa was almost eaten away by a mass of similar ulcerations which had run together at their edges, and which formed a broad and deep ulcerous sore. A similar lesion seemed to have destroyed, through its whole thickness, the mucosa of the laryngeal ventricle on the right side; an oblong ulceration with indurated borders cut straight down had its seat on the median line of the anterior surface of the conduit immediately below the lower border of the cricoid cartilage. Finally, on the upper half of the trachea the mucosa presented five or six miliary ulcerations stretching out alongside the conduit and slightly projecting on the surface of the uninjured membrane. The mucosa of the bronchi and the pulmonary tissue presented absolutely no lesion. To sum up, the post-mortem showed no injuries except on the mucosa of the primary respiratory passages: those observed during life on the surface of the pituitary membrane in the explorable part of the nasal cavities could easily be distinguished from the lesions of chronic glanders. Those turgidities of the mucosa, ulcerated on the surface, presenting the same appearance for years without producing induration of the ganglia of the alveus, had nothing in common with glanders, but it was quite different with the lesions of the larynx and trachea: their appearance was exactly that of the ulcerations of chronic glanders. "For my own part," says M. Nocard, "if I had found such lesions at the post-mortem of a horse whose antecedents had been unknown to me, I should at once have concluded on the existence of glanders." Yet it was quite another story. What was the nature of these lesions? It is difficult to say exactly. M. Nocard confessed that he and his colleagues were baffled, and yet it was to be noted that the mallein indications were quite clear and precise; even when the clinical signs favoured the diagnosis of glanders, mallein gave no support to any such diagnosis. This case shows how invaluable are the services rendered by that important reactive.

(*Recueil de Méd. Vét.*, Dec. 1900.)

THE ECONOMICS OF SLAUGHTER-HOUSE DESTRUCTION: UTILISATION OF WASTE PRODUCTS.

M. LAURENT read a paper on the above subject at a meeting of the Société Centrale, which we summarise. M. Laurent stated that he sent all condemned carcases to be burnt—or, to use the right word, incinerated—in the retorts of a gaswork at Bar-le-Duc. The process is simple, costs little, and is hygienically important; the products might be useful in agriculture. It is well known that the organic matter of carcases contains carbon, oxygen, hydrogen, and nitrogen in combination, the same as coal. Distillation in closed vessels or retorts gives not only gas for illuminating purposes, but also ammoniacal liquor, and ash is used in agriculture. On 2d October 1898 M. Laurent sent the carcase of a cow, which had been condemned as being affected with generalised tuberculosis, to be incinerated. The weight of the animal, minus skin and viscera, was 210 kilogrammes (or 462 lbs.). The manager of the gasworks took measures to test the economic value of the incinerated carcase by reserving a special retort for the purpose. Subsequent analysis showed—

Powder, phosphuric acid,	28·34 per cent.
Tribasic phosphate of lime,	61·86 —
Liquor, ammoniacal nitrogen,	9·68 grammes per litre.
Total nitrogen,	11·72 per cent.

These ashes may be considered a manure very rich in phosphates; the liquid, containing as it does only 9·68 grammes of ammoniacal nitrogen per litre, can only be used for sprinkling. The temperature of the retorts which received the carcase was from 900 to 1000 degrees Centigrade. The carcase was cut into pieces of 5 to 6 kilos. in order to be more easily handled, and these pieces were thrown into the retorts from a distance. This was done because when the pieces touched the red-hot walls of the retort there rushed out immediately a jet of gas, smoke, and flame which threatened to burn the face of the operator. When the retort was full it was closed as for the production of gas, and distillation commenced. The operation lasted four hours. It was found that the 210 kilos. of flesh, fat, and bone had produced 45 cubic metres of gas. The distilled liquor drawn off was 117·61 litres, which equals 118·42 kilos. of liquor produced, or 56·39 per cent. of the incinerated matter.

In addition to the gas obtained, which is sold at 30 centimes per cubic metre (in this case $45 \times {\cdot}30 = 13$ fr. 50 cent.), there was obtained 40 kilos. of solid matter, or 19 per cent. of the weight of the animal. This solid residue, as above stated, contained 28·34 per cent. of phosphoric acid and 61·86 per cent. of tribasic phosphate of lime.

Another experiment was tried with a pig weighing 50 kilos., which was condemned because it arrived dead at the abattoir. It was treated as above. The operation lasted four hours, and the result was $2\frac{1}{2}$ kilos. of solid residue. M. Laurent concludes from these experiments that the destruction of carcases can be conducted without cost at gasworks; the gas can go into consumption and the other products can be sold to farmers or gardeners as rich manures. There is no question, of course, that from the point of view of sanitation burning is infinitely superior to burying.

(*Recueil de Méd. Vét.*, Dec. 1900.)

Notes and News.

HARVARD TO CLOSE ITS VETERINARY SCHOOL.

We regret to find the following dispatch in the *New York Times* of Nov. 21:

"Cambridge, Mass., *Nov.* 20.—Because of the successive annual deficits in the accounts of the Veterinary Department of the University, the Corporation of Harvard has decided to receive no more students for that department, but the students already in the school will be given sufficient instructions to obtain their degrees."

One of the first, if not the very first, of the great universities to hold forth a helping hand to a science which at the time was sorely in need of recognition and assistance by such high authority, the profession may well feel keen regret at the decision which has been reached by the Corporation of the University. It was never a self-supporting department, we believe, but has persisted in its instructions largely through patriotic motives, and

in the hope that its efforts would finally receive sufficient appreciation to be financially successful.

After the above was in type we wrote to Director Lyman asking fuller particulars of the announcement, as it had been widely published, and the following reply was received, which we are more than pleased to print in full, since a strong hope is held out that the school may yet go forward even upon a stronger basis than ever :—

"HARVARD UNIVERSITY,
"SCHOOL OF VETERINARY MEDICINE,
"50 VILLAGE ST., BOSTON, *Nov.* 30, 1900.

"Dear Doctor Bell— . . . It is true that on the 12th of this month the Corporation of Harvard College voted that notice should be given that no new students in veterinary medicine will be received by the University until further order of the President and Fellows; but that the instruction to students now in the school should be completed, so far as any of them may desire, until the entire course has been given—that is, until June 30th, 1903. You will see that this vote does not necessarily contemplate the closing of the school even in 1903, and therefore differs materially from the statement which you have copied from the *New York Times*.

"The facts are, shortly stated, as follows: This school has never received any endowment whatever. As a result of this it has, of course, been impossible to give the quality of instruction, which is deemed desirable, within its income; the annual deficits have therefore, until now and for the last eighteen years, been paid by the University, and we feel that unless endowment can be raised, from which the school may be placed upon something nearer a self-sustaining basis, it will be better for us to give up the further teaching of Veterinary Medicine; but I am far from being without hope that this desired endowment will not be raised before our organisation will have been given up in 1903.

"When first organised the school had a definite plan of procedure mapped out, which has been followed, up to this time, by good results; its further development will necessitate, by probably lessening the number of students for a time, a still larger annual deficit. Under these circumstances, the school feels it prefers to stop, if it must, where it is, rather than to go forward upon an insecure foundation.—Yours very truly,

"CHARLES P. LYMAN, *Dean*."

"Dr. H. G. Patterson, of St. Joseph, Mo., has returned to take up his practice in that city after five months' service with the British Government in the transportation of animals to South Africa. The doctor reports successful and pleasant voyages, and a jolly good time.

"Dr. H. E. Rice, of Little Rock, Ark.; Dr. D. G. Moberly, of Kansas City, Mo.; Dr. Ed. Makins, of Abeline, Kans.; Dr. H. C. Simpson, of Dennison, Iowa; and Dr. C. E. Monney, of Hiawatha, Kans., have journeyed to South Africa in the service of the British Government."

[It would seem from the above that the supply of veterinary surgeons from Britain is now exhausted, or that the American veterinary surgeon, who does not possess a diploma recognised in Britain, is a cheaper or a better man.

It must be remembered that these Americans go in *veterinary* charge of British horses and mules; that they associate with the transport and ship's

officers as social equals, and are cabin passengers; and that their fare is paid from any part of America to the port of embarkation in America, and their return fare is paid from Africa home again.

Has the Council anything to say in this matter?—ED.]

THE TRANSMISSION OF TUBERCULOSIS BY HUMAN MILK.—The *Revista de medecina y chirurgia Prácticas*, citing *Progrés Médical*, says that Dr. Roger and Dr. Garnier recently reported to the Paris Society of Biology the following facts:—They found the bacillus of tuberculosis in the milk of a woman who died from miliary tuberculosis seventeen days after childbirth, without the existence of any tuberculous lesions in the mammary glands. This milk was taken with aseptic precautions and inoculated into two small Indian rabbits. The first, which had received subcutaneously four cubic centimeters, succumbed after thirty-three days, with generalised typical tuberculous lesions; the second, into which only two cubic centimeters were injected, did not die, and when it was killed, ten months later, only simple non-tuberculous cicatrices were found. The infant died after six months, with tubercle in the mesenteric glands, the liver, spleen, and kidneys. From these facts it appeared that the intestine formed the point of entrance. This case, the writers think, shows that the milk from a tuberculous woman may contain the bacillus of Koch and transmit tuberculosis.

THE most scandalous of all the mismanagement which has occurred in connection with the war is that which has clogged our Army in South Africa with thousands of worthless remounts, raked from all the lowest class markets of the world, while the official mind remains stubbornly opposed to purchasing in England or in Ireland. My readers may hardly credit this latter statement, but it is the very truth, as the following copy of a War Office letter will prove. It is in response to an offer to collect from twenty-five to fifty good horses weekly, for as long as might be required, in a stable near Newark, if a purchasing officer would come regularly to deal with them. This is the answer:—

"WAR OFFICE, LONDON, S.W.,
"*January* 4, 1901.

"SIR—I am directed by the Secretary of State for War to acknowledge the receipt of your letter of the 4th inst., and while thanking you for the same, am to inform you that the horses you offer are not at present required.
—I am, Sir, your obedient Servant,

H. MORGAN (for I.G.R.)."

I may add that the offer in question has been a standing one ever since last May, and from twenty-five to fifty horses a week could have been supplied throughout the whole intervening period; good, hardy, well-bred horses, not soft brutes that would lie down and die. I confess I am at a loss to understand the depths of fatuity which can induce even a War Office Solon to commit himself to such an outrageous statement as that "horses are not at present required!"

As to what is really the state of the remount question in South Africa, I am enabled to quote from a valued correspondent at Port Elizabeth, who, writing under date the 18th ult., says:—

"I have read with interest the letters appearing in *The Sportsman re* remounts. It is disgraceful the way they have bought horses, not only horses that have been imported, but horses in this Colony—any three-legged crock would be passed by the Army Vet. or the Remount Officer.

"I call it a scandalous shame that public money is being wasted in the way it has been done. It is nothing less than a wanton waste of money.

"I have met a good many of the Army Vets. out here, and it is a good thing they are in the Army, as I am certain they would never make a living by their profession out of it."

My correspondent appears to have been unfortunate in the particular veterinary officers he has encountered, and his words must not be taken as extending further than to the actual individuals whom he has in mind; but he is a shrewd sportsman, and not at all likely to exaggerate the scandal with which he deals.

The War Office letter quoted above in refusing horses from Newark is only a sample of the stereotyped answer that is sent to any similar offer from other parts of the country. I could mention half a dozen other centres where horses could equally well be collected and several hundred a week could easily be bought, and could have been bought for months past. The class of animal I have in mind may be indicated by what one of them, a mare, did a little time ago, viz., she went seventy miles one day and pulled out quite fresh the next morning, and covered another twenty miles without being any the worse. But this stamp of remount is "not at present required!" Is it not intolerable that folly should dominate the people who for our sins are placed in authority over us?

(*The Sportsman*, Jan. 9th.)

Correspondence.

SIR—The following letter, with advertisement, was forwarded me recently, and I think the subject is one well worth consideration by members of the profession, as we all know that the pig is one of the most susceptible of animals to tuberculosis, and more particularly to a general and not local form of that disease.

I made it my business to have the question laid before the members of the Public Health Committee and received an assurance that the matter would be inquired into.

I trust that in time a report on the matter will be made by the Sanitary Inspector, and that I shall be able to publish some valuable information.—I remain, Sir, your obedient servant, F.R C.V.S.

"PIGS' MEAT.—OFFERS are requested for the PURCHASE of REFUSE FOOD, &c., at . . . . . for Twelve Months from 1st January 1901. Information as to condition, probable quantity, &c., to be had at the Hospital from the Porter.

"Offers to be lodged with the undersigned on or before Friday, inst.

"Secretary and Treasurer."

"Could . . . . use his influence in putting a stop to the above.

"Pigs' meat from "*Refuse, &c.*" (probably including poultices) from an Incurable Hospital—and indeed from any hospital—is surely a direct way of disseminating disease."

Obituary.

THE LATE Dr. STEVENSON MACADAM.

On the 24th January the death of Dr. Stevenson Macadam occurred at his residence in Portobello. Born in Glasgow in 1829, the deceased gentleman had attained seventy-two years of age. Of four sons in the family three took to chemistry as a profession; the subject of our notice having succeeded his brother John as assistant to Dr. George Wilson, of Edinburgh, in 1847. After Dr. George Wilson's appointment to the Chair of Technology in the University, Dr. Stevenson Macadam became Lecturer on Chemistry in the School of Medicine, and for some time afterwards conducted his classes at the School of Arts, then in Adam Square. On a larger Lecture Room being built at Surgeons' Hall his class was removed to that building, and he continued teaching there until the close of last Summer Session, at which period he had completed fifty years as a lecturer, forty-five of which had been as an independent teacher.

As a lecturer and a teacher Dr. Macadam was a distinct success, and the large classes he gathered together are a standing memorial to his powers in this direction. Early in life he graduated as Doctor of Philosophy at the University of Giessen, and in 1855 he was elected a Fellow of the Royal Society of Edinburgh. Always anxious for the technical side of his subject, he joined the Royal Scottish Society of Arts in 1854, and served in various offices until 1862, when he was made President, which office he held until the close of 1864. Whilst in this office he had the honour to come into contact with the late Prince Consort, of whose kindly presence he was ever ready to talk. Dr. Macadam was an original member of the Institute of Chemistry and of the Society of Chemical Industry, and took an active part in the formation of these bodies. He was the author of many papers on scientific questions, mostly dealing with technical subjects, such as water supply, drainage, and the application of chemistry to the arts and manufactures. He conducted a large consulting business, and was much sought after for expert evidence. His cool, clear evidence was in strange contrast to his nervous disposition, but all the same the strain of such work frequently left him much prostrated. In his earlier days he was associated with Professors Dick and Gamgee, but threw in his lot with the late Principal Williams when that gentleman started the New Veterinary College. He remained on the staff of that College until it was removed to Elm Row, when he resigned in favour of his son, Professor Ivison Macadam. A busy man, he yet found time for much active exercise, and was a splendid walker and a good rower. Sport also found in him a devotee, and he was a keen angler both for trout and salmon. As a fisher he was a well-known member of the Edinburgh Angling Club, of which, at the time of his death, he was President. For some years past he has been a regular attender at the hunts of the Dumfriesshire Otter Hounds. He is survived by a widow and by a family of two sons and two daughters.

CONTAGIOUS DISEASES ANIMALS ACTS, 1864 AND 1890.

SUMMARY OF RETURNS OF OUTBREAKS for the Four Weeks ending 12th January 1901.

ENGLAND AND WALES.

Swine Fever.	Glanders (including Farcy).	Rabies.	Anthrax.	Foot and Mouth Disease.	Sheep-Scab (for month of December).
Outbreaks 141 Slaughtered 982	Outbreaks 89 Attacked 154	None.	Outbreaks 34 Attacked 63	Outbreaks 3 Attacked 22	Outbreaks 356

SCOTLAND.

Outbreaks 1 Slaughtered 12	Outbreaks 2 Attacked 4	None.	Outbreaks 20 Attacked 25	None.	Outbreaks 12

IRELAND.

Outbreaks 23 Slaughtered 270	None.	Dogs Attacked 1 Other Animals 0	None.	None.	Outbreaks 102

Communications, Books, Journals, &c., Received.

Agricultural Journal (Cape of Good Hope); Berliner Thierärztliche Wochenschrift; La Clinica Veterinaria (Milan); Deutsche Thierärztliche Wochenschrift; Tannoform in Veterinary Medicine (March); The Sanitary Journal; Scottish Medical and Surgical Journal; Veterinary Record; La Riforma Veterinaria; Le Mois Scientifique (Paris); L'Echo Vétérinaire (Liège); Annales de Médecine Vétérinaire (Brussels); Johns Hopkins Hospital Reports; Journal of Comparative Medicine and Veterinary Archives; Recueil de Médecine Vétérinaire; Gazette Médicale de Paris; Modern Medicine; Johns Hopkins Hospital Bulletin; Il Veterinario di Campagna (Moncalieri); Le Bulletin Vétérinaire (Orleans); Revista de Medicina Veterinaria (Bucarist); La Revista Veterinaria (Buenos Aires); Zeitschrift für Fleisch-und Milchhygiene (Berlin).

Received for Review—Veterinary Posology,—Banham; Riding and Hunting,—Captain M. H. Hayes; Operations, Cursus,—Pfeiffer; Annual Report of the Bengal Veterinary College, and of the Civil Veterinary Department.